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# HANDBOOK OF THE BENET-MERCIÉ MACHINE RIFLE

MODEL OF 1909

WITH

PACK OUTFITS AND ACCESSORIES

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THIRTY-ONE PLATES

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MARCH, 1912

REVISED OCTOBER 8, 1915

REVISED JULY 31, 1916

REVISED SEPTEMBER 6, 1917



WASHINGTON  
GOVERNMENT PRINTING OFFICE

1917

111-75  
B4116  
1907

111-75  
B4116  
1907

**WAR DEPARTMENT,  
OFFICE OF THE CHIEF OF ORDNANCE,  
*Washington, September 6, 1917.***

**This manual is published for the information and government of the Regular Army and National Guard of the United States.**

**By order of the Secretary of War:**

**WILLIAM CROZIER,  
*Brigadier General, Chief of Ordnance.***

**(3)**

**370988**



## LIST OF PLATES.

	Faces page—
I. Right side view of rifle in firing position.....	8
II. Right side view of rifle in traveling position.....	9
III. Plan view of rifle in firing position.....	8
IV. Longitudinal section through rifle.....	9
V. Component parts of rifle.....	14
VI. Component parts of rifle.....	15
VII. Component parts of rifle.....	20
VIII. Failure of mechanism to close completely owing to undue friction in parts.....	38
IX. Showing where burrs are likely to be found on actuator.....	39
X. Testing to see if locking nut holds barrel tightly to the receiver....	38
XI. Testing position of tongue.....	39
XII. Testing breechblock and extractor.....	40
XIII. Testing the trigger mechanism.....	41
XIV. Actuator striking gas nozzle on account of loose locking nut.....	40
XV. Testing the setting of the resizing tool.....	41
XVI. Defective cartridge extractor.....	44
XVII. Telescopic sight and pouch.....	48
XVIII. Views of telescopic sight.....	49
XIX. Tools and accessories.....	52
XX. Ammunition box.....	53
XXI. Cases.....	56
XXII. Pack harness.....	57
XXIII. Pack harness.....	58
XXIV. Aparejo, model of 1911, frame (right half).....	59
XXV. Pack, first mule (right side).....	62
XXVI. Pack, first mule (left side).....	63
XXVII. Pack, second mule (right side).....	62
XXVIII. Pack, second mule (left side).....	63
XXIX. Pack, third mule (right side).....	62
XXX. Pack, third mule (left side).....	63
XXXI. Special pack equipment.....	62



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## EQUIPMENT OF MACHINE-GUN COMPANY OR TROOP.

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Each machine-gun company or troop is provided with six rifles, including ammunition, spare parts, tools, and accessories, together with the necessary packs.

The equipment for each company or troop is carried on 24 mules, constituting six sections of four each. The sections are essentially complete units, although certain articles are not carried in every section.

The equipment of each section consists of one rifle, ammunition, and the necessary equipment for maneuvering the piece in the field.

The description is divided into the following parts:

Part I. The rifle with its ammunition and accompanying parts.

Part II. The pack harness.

Part III. The special pack equipment.

Part IV. The pioneer tools.

Part V. The total equipment of a machine-gun company or troop.

## **PART I.—THE RIFLE WITH ITS AMMUNITION AND ACCOMPANYING PARTS.**

### **DESCRIPTION OF THE BENET-MERCIÉ MACHINE RIFLE, MODEL OF 1909.**

#### **GENERAL.**

[Plates I, II, III, and IV.]

The Benet-Mercié machine rifle, model of 1909, belongs to that type of automatic arms known as the gas operative. The power that is used to operate the mechanism is obtained from a small portion of the powder gases that enter through a port in the barrel after the bullet has passed. After the first shot the rifle is self-operative, until the ammunition in the feed strip is exhausted or until the trigger is released.

The ballistics of the Benet-Mercié machine rifle, model of 1909, are similar to those of the service rifle, and the data given in the handbook of the service rifle, No. 1923, is equally applicable to the Benet-Mercié machine rifle, model of 1909. The bullet suffers a slight decrease in muzzle velocity due to the gas used in operating the rifle, but for general purposes the data quoted is sufficiently accurate.

In firing, the action of the mechanism is as follows:

When the rifle is fired and the bullet has passed the gas port in the barrel a part of the powder gas passes into the chamber of the gas-nozzle ring, and enters the gas cup of the actuator, forcing the latter to the rear. The actuator in recoiling compresses the actuator spring, the cam surface cut in its upper portion engaging the lug of the ferreture nut, causing the latter to rotate so as to disengage its threads from those of the breechblock. At this part of the recoil the firing pin, which has been drawn back by the actuator, engages its upper lug in the ramp of the receiver. The firing pin then rotates on its axis and its upper lug comes to rest in the transverse cut of the breechblock, thus locking the latter to the actuator. The large lug of the actuator strikes against the shoulder of the breechblock, drawing the latter to the rear and thereby completing the opening of the breech. The claw of the extractor engages the groove of the cartridge case and draws it from the chamber. During the recoil of the breechblock the head of the cartridge case strikes against the ejector, throwing the case out of the rifle through the ejection opening in the receiver. When the actuator is partly recoiled the cam surface cut on its right side engages the upper lug of the feed piece, causing the latter to rotate from right to left on its axis. The feed arm of the



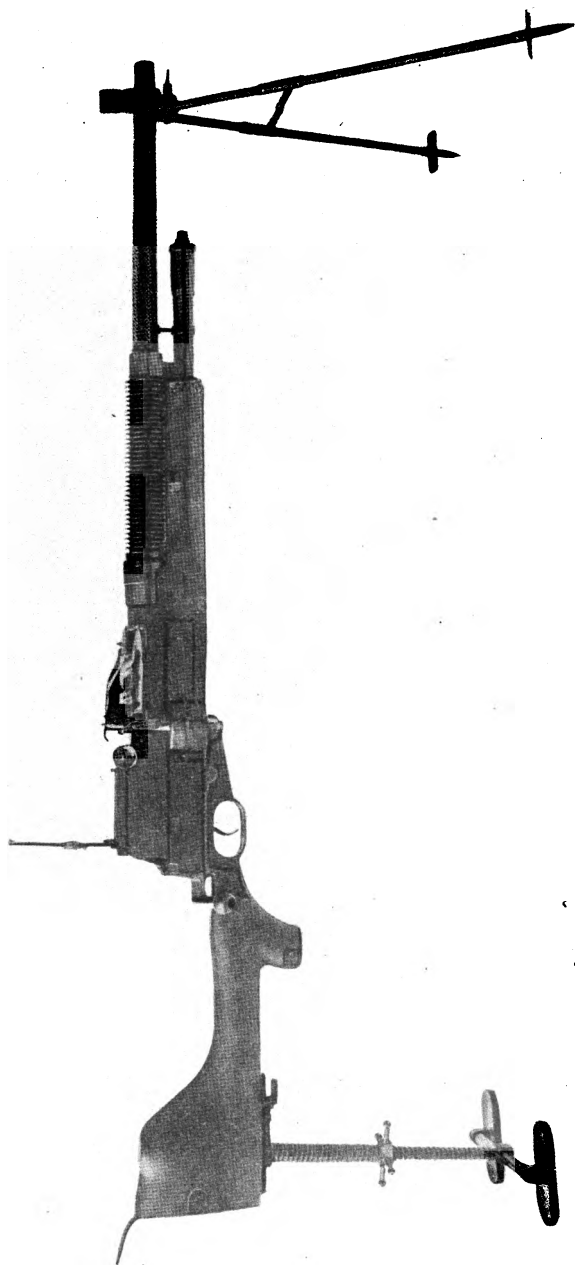
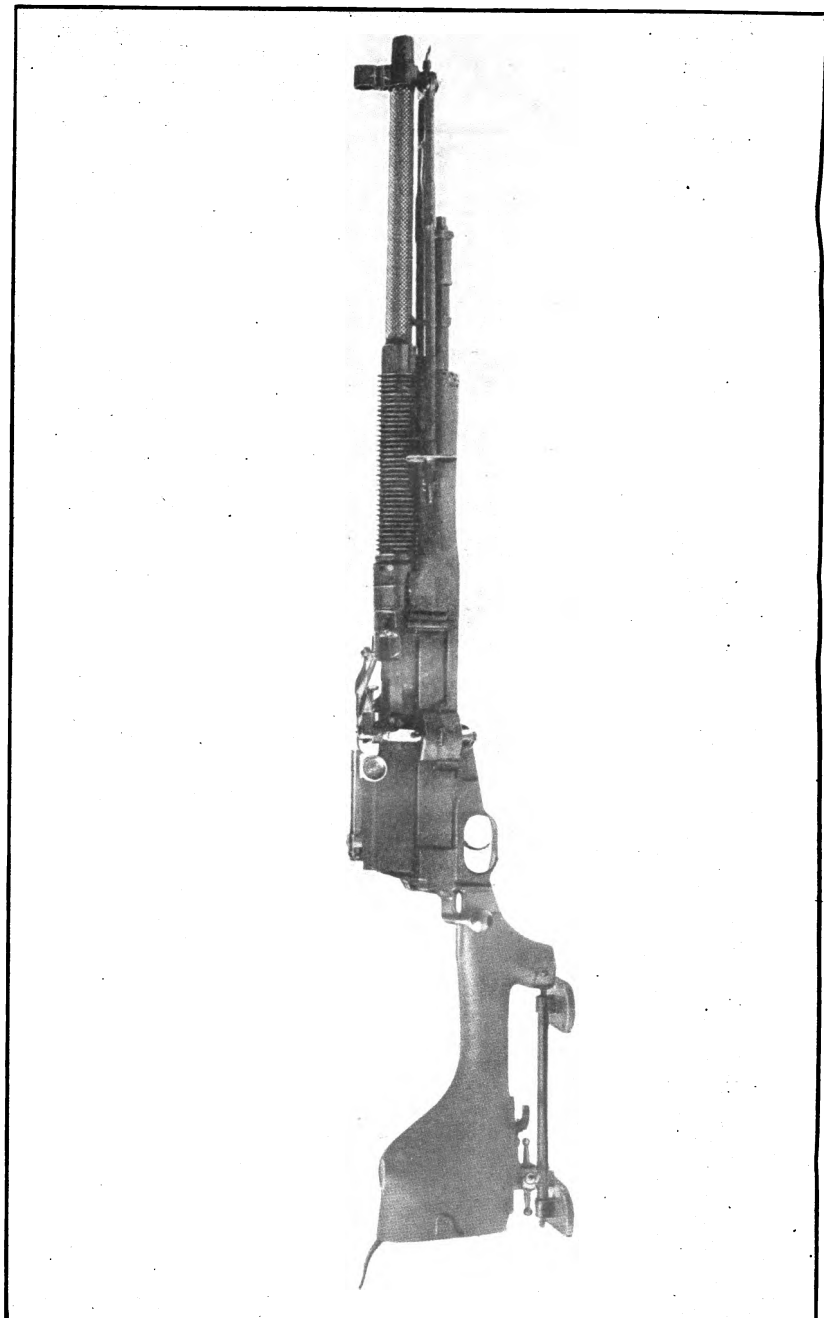
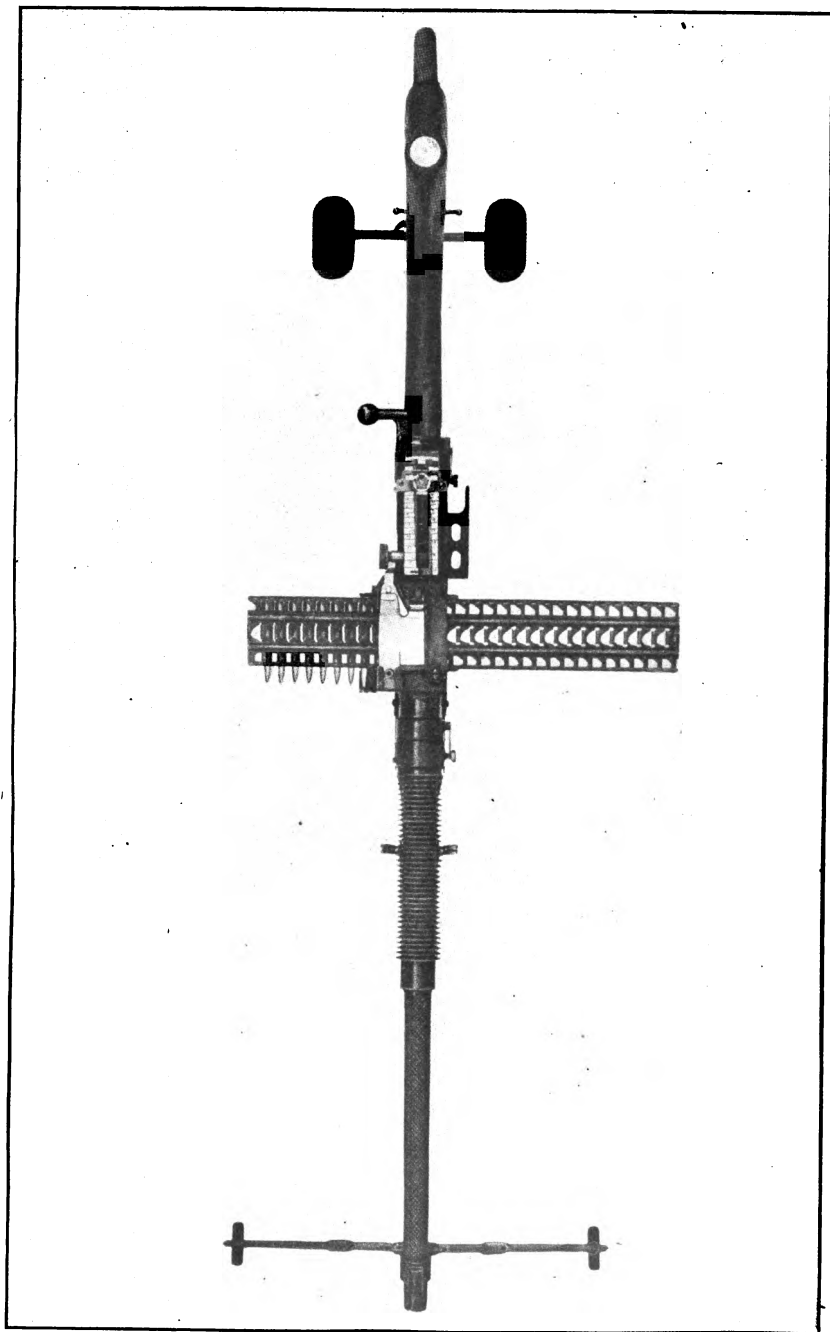


PLATE II











feed piece engages its lug in the central opening of the feed strip, forcing the latter into the rifle and placing a cartridge in the loading position in front of the chamber. The pawl of the feed-piece spring engages in the lateral openings of the feed strip, thereby holding the latter in place and preventing its being drawn to the right when the feed arm of the feed piece, having advanced the feed strip one notch, returns to its original position by sliding over the feed strip in order to engage in the next hole. Finally, when the actuator is almost recoiled (supposing the rifle to be set for single shots), the sear engages in the cocking notch of the actuator and the latter is held back ready for the next shot.

When the trigger is pulled the sear is disengaged from the actuator, which, now being free, is thrown forward, due to the force exerted by the actuator spring. During this movement the actuator carries forward the breechblock, to which it is connected by means of the large lug of the firing pin. The breechblock strikes the cartridge, forces it into the chamber, and the claw of the extractor engages the groove of the cartridge case. As soon as the breechblock engages the fermeture nut the large lug of the firing pin engages in the ramp of the receiver, causing the firing pin to rotate so as to disengage this lug from the transverse cut of the breechblock. The firing pin is then free and may move forward. The actuator continues its forward movement and its cam face engages the lug of the fermeture nut, rotating the latter so as to cause its threads to engage with those of the breechblock. The breech is now closed and locked. The firing pin striking the primer fires the piece. During this forward movement of the actuator, the small cam surface cut on its right side engages the lower lug of the feed piece, causing it to rotate from left to right. The feed arm is actuated by this movement, and its feed glides over the feed strip and engages in the next opening of the latter, ready to feed the feed strip another notch into the rifle when the actuator again recoils.

The following table gives a serial list of component parts of this rifle:

#### SERIAL LIST OF COMPONENT PARTS.

[Numbers before components refer to numbers shown on Plates IV, V, VI, VII, XVII, and XVIII. Property classification: Class IV, section 1.]

- |                                     |                               |
|-------------------------------------|-------------------------------|
| 1. Receiver.                        | 10. Actuator spring.          |
| 2. Ejector bushing.                 | 11. Barrel rest (complete).   |
| 3. Rear feed guide.                 | 12. Front sight carrier.      |
| 4. Feed-guide assembling screw (7). | 13. Sight-carrier pin.        |
| 5. Bottom-plate rivet (11).         | 14. Barrel.                   |
| 6. Bottom plate.                    | 15. Gas-cylinder support.     |
| 7. Front feed guide.                | 16. Gas-cylinder support pin. |
| 8. Actuator.                        | 17. Gas-nozzle ring pin.      |
| 9. Actuator bushing pin.            | 18. Gas-nozzle ring.          |

19. Orifice screw.
20. Radiator.
21. Radiator pin.
22. Locking-nut stop.
23. Elevating-mechanism feet (2).
24. Elevating-mechanism guide rod.
25. Inner elevating screw.
26. Elevating-mechanism foot pins (4).
27. End plug (2).
28. Outer elevating screw.
29. Elevating-screw tube, with cap.
30. Elevating-screw tube washer.
31. Front stiffening piece.
32. Body stiffening piece.
33. Assembling plates (2).
34. Hand-guard rivet, short (6).
35. Hand guard.
36. Catches for barrel rest leg (2).
37. Hand-guard rivet, long (8).
38. Leg catch spring (2).
39. Hand-guard rivets, short (10).
40. Regulator piston.
41. Regulator sleeve.
42. Regulator-sleeve pin.
43. Spring-seat pin (2).
44. Guard.
45. Butt plate.
46. Stock.
47. Actuator-spring seat.
48. Cocking-handle knob.
49. Cocking-handle rivet (3).
50. Cocking-handle shank.
51. Actuator bushing.
52. Firing pin.
53. Closing spring.
54. Feed-piece housing cover.
55. Feed-piece spring button (2).
56. Cover-plate screw.
- 56a. Cover-plate screw washer.
57. Cover plate.
58. Feed-piece spring.
59. Feed-piece spring stud.
60. Feed-piece spring-stud rivet (2).
61. Feed-piece spring-pawl rivet (2).
62. Feed-piece spring pawl.
63. Extractor.
- 63a. Dismounting tool (extractor).
64. Breechblock.
65. Trigger.
66. Sear-spring pin.
67. Sear spring.
68. Sear.
69. Sear-spring lever.
70. Locking screw (2).
- 70a. Locking nut screw.
- 70b. Check nut.
71. Feed piece.
72. Fermeture nut.
73. Extractor spring.
74. Binder lever.
75. Elevating-screw slide.
76. Elevating-screw slide pin.
77. Binder.
78. Locking nut.
79. Hand-guard stud.
80. Slide-guide pins (2).
81. Binder spring.
82. Slide spring.
83. Binder lever pivot.
84. Latch plate.
85. Latch-plate screw.
86. Slide-guide pin pins (2).
87. Butt-plate screw.
88. Butt-plate screw, wood (2).
89. Latch spring.
90. Spring screw.
91. Stock bolt.
92. Separator split pin.
93. Guard screw.
94. Connecting piece, female.
95. Connecting piece, male.
96. Plunger spring.
97. Plunger ring.
98. Plunger.
99. Barrel-rest head.
100. Separator nut.
101. Separator bolt.
102. Separator-bolt pin.
103. Separator axis (2).
104. Separator (2).
105. Front-leg axis (2).
106. Front-leg feet (2).
107. Foot rivets (2).
108. Front leg (2).
109. Front sight.
110. Hinge pin.
111. Cover screw (2).
112. Front-sight screw.
113. Front-sight cover.
114. Cartridge-stop spring.
115. Cartridge-base stop.
116. Ejector spring.
117. Ejector cap.
118. Ejector.
119. Cartridge stop.
120. Cartridge-stop holder.
121. Slide cap.
122. Leaf.



- |                                      |   |
|--------------------------------------|---|
| 123. Slide.                          | 153. Cleaning-rod stem and sleeve.            |
| 124. Windage-screw knob.             | 154. Cleaning-brush holder.                   |
| 125. Windage-screw pin.              | 155. Rammer.                                  |
| 126. Windage screw.                  | 156. Defective-cartridge extractor.           |
| 127. Windage-screw spring.           | 157. Hand extractor.                          |
| 128. Windage-screw collar.           | 158. Screw driver.                            |
| 129. Elevating-screw head.           | 159. Copper hammer.                           |
| 130. Elevating-screw pin.            | 160. Drift.                                   |
| 131. Elevating screw.                | 161. Loading-tool handle.                     |
| 132. Half-nut spring.                | 162. Lever axis.                              |
| 133. Half nut.                       | 163. Lever (one right, one left).             |
| 134. Pivot.                          | 164. Loading-tool foot (2), short.            |
| 135. Pivot-spring.                   | 165. Pushing-bar guide slide.                 |
| 136. Fixed-base screw.               | 166. Screw (4 long, 8 medium, 4 short).       |
| 137. Slide-cap screw, small.         | 167. Strip guide.                             |
| 138. Slide-cap screw, large.         | 168. Loading-tool foot (long), 1.             |
| 139. Aperture disk.                  | 169. Pushing bar.                             |
| 140. Base spring.                    | 170. Pushing-bar axis.                        |
| 141. Drift slide.                    | 171. Pushing-bar guide.                       |
| 142. Movable base.                   | 172. Pliers.                                  |
| 143. Leaf-joint pin.                 | 173. Grease brush.                            |
| 144. Rear-sight fixed base.          | 174. Cleaning brush.                          |
| 145. Dismounting wrench.             | 175. Feed strip.                              |
| 146. Ejector key.                    | 176. Oil can, including nozzle cap and chain. |
| 147. Resizing-tool frame.            | 177. Gas-cylinder cleaner.                    |
| 148. Adjusting screws (2).           | 178. Cooling sponge.                          |
| 149. Resizing-tool roller.           | 179. Grease pot.                              |
| 150. Blocking screws (4).            | 180. Sight-bracket screws (3).                |
| 151. Resizing-tool roller support.   | 181. Telescopic-sight bracket.                |
| 152. Cleaning-rod handle and sleeve. |   |

#### DETAILED DESCRIPTION OF THE RIFLE COMPONENTS.

The component parts of the rifle arranged alphabetically are given in the following list:

[Numbers after components refer to numbers shown on plates. Property classification: Class IV, section 1.]

- |                                 |   |
|---------------------------------|---|
| Actuator (8).                   | Blocking screws (150) (four).           |
| Actuator bushing (51).          | Body-stiffening piece (32).             |
| Actuator-bushing pin (9).       | Bottom plate (6).                       |
| Actuator spring (10).           | Bottom-plate rivet (5) (eleven).        |
| Actuator-spring seat (47).      | Breechblock (64).                       |
| Adjusting screws (148) (three). | Butt plate (45).                        |
| Aperture disk (139).            | Butt-plate screw (87).                  |
| Assembling plates (33) (two).   | Butt-plate screw, wood (88) (two).      |
| Barrel (14).                    | Cartridge-base stop (115).              |
| Barrel rest (complete) (11).    | Cartridge stop (119).                   |
| Barrel-rest head (99).          | Cartridge-stop holder (120).            |
| Base spring (140).              | Cartridge-stop spring (114).            |
| Binder (77).                    | Catches for barrel-rest leg (36) (two). |
| Binder spring (81).             | Check nut (70b).                        |
| Binder lever (74).              | Cleaning brush (174).                   |
| Binder-lever pivot (83).        | Cleaning-brush holder (154).            |

- Cleaning-rod handle and sleeve (152).  
 Cleaning-rod stem and sleeve (153).  
 Closing spring (53).  
 Cocking-handle knob (48).  
 Cocking-handle shank (50).  
 Cocking-handle rivet (49) (three).  
 Connecting piece, female (94).  
 Connecting piece, male (95).  
 Cooling sponge (178).  
 Copper hammer (159).  
 Cover plate (57).  
 Cover-plate screw (56).  
 Cover-plate screw washer (56a).  
 Cover screw (111) (two).  
 Defective-cartridge extractor (156).  
 Dismounting tool (extractor) (63a).  
 Dismounting wrench (145).  
 Drift (160).  
 Drift slide (141).  
 Ejector (118).  
 Ejector bushing (2).  
 Ejector cap (117).  
 Ejector key (146).  
 Ejector spring (116).  
 Elevating-mechanism feet (23) (two).  
 Elevating-mechanism foot pins (26) (four).  
 Elevating-mechanism guide rod (24).  
 Elevating screw (131).  
 Elevating-screw pin (130).  
 Elevating-screw slide pin (76).  
 Elevating-screw head (129).  
 Elevating-screw slide (75).  
 Elevating-screw tube, with cap (29).  
 Elevating-screw tube washer (30).  
 End plug (27) (two).  
 Extractor (63).  
 Extractor spring (73).  
 Feed-guide assembling screws (4) (seven).  
 Feed piece (71).  
 Feed-piece housing cover (54).  
 Feed-piece spring (58).  
 Feed-piece spring button (55) (two).  
 Feed-piece spring pawl (62).  
 Feed-piece spring pawl rivet (61) (two).  
 Feed-piece spring stud rivet (60) (two).  
 Feed-piece spring stud (59).  
 Feed strip (175).  
 Fermeture nut (72).  
 Firing pin (52).  
 Fixed-base screw (136).  
 Front-feed guide (7).  
 Front leg (108) (two).  
 Front-leg axis (105) (two).  
 Front-leg foot (106) (two).  
 Foot rivets (107) (two).  
 Front sight (109).  
 Front-sight carrier (12).  
 Front-sight cover (113).  
 Front-sight screw (112).  
 Front-stiffening piece (81).  
 Gas-cylinder cleaner (177).  
 Gas-cylinder support (15).  
 Gas-cylinder support pin (16).  
 Gas-nozzle ring (18).  
 Gas-nozzle ring pin (17).  
 Grease brush (173).  
 Grease pot (179).  
 Guard (44).  
 Guard screw (93).  
 Half nut (133).  
 Half-nut spring (132).  
 Handle extractor (157).  
 Hand guard (35).  
 Hand-guard rivet (37) (34) (39) (twenty-four).  
 Hand-guard stud (79).  
 Hinge pin (110).  
 Inner elevating screw (25).  
 Latch plate (84).  
 Latch-plate screw (85).  
 Latch spring (89).  
 Leaf (122).  
 Leaf-joint pin (143).  
 Leg-catch spring (38) (two).  
 Lever (1 right, 1 left) (163).  
 Lever axis (162).  
 Loading-tool foot (2) short (164).  
 Loading-tool foot, long (168).  
 Loading-tool handle (161).  
 Locking nut (78).  
 Locking-nut screw (70a).  
 Locking-nut stop (22).  
 Locking screw (70) (two).  
 Movable base (142).  
 Oil can, including nozzle cap and chain (176).  
 Orifice screw (19).  
 Outer elevating screw (28).  
 Pivot (134).  
 Pivot spring (135).  
 Pliers (172).  
 Plunger (98).  
 Plunger ring (97).  
 Plunger spring (96).

- Pushing bar (169).
- Pushing-bar axis (170).
- Pushing-bar guide (171).
- Pushing-bar guide slide (165).
- Radiator (20).
- Radiator pin (21).
- Rammer (155).
- Rear feed guide (3).
- Rear-sight fixed base (144).
- Receiver (1).
- Regulator piston (40).
- Regulator sleeve (41).
- Regulator-sleeve pin (42).
- Resizing-tool frame (147).
- Resizing-tool roller (149).
- Resizing-tool roller support (151).
- Screw (4 long, 8 medium, 4 short) (166).
- Screw driver (158).
- Sear (68).
- Sear spring (67).
- Sear-spring lever (69).
- Sear-spring pin (66).
- Separator (104) (two).
- Separator axis (103).
- Separator bolt (101).
- Separator-bolt pin (102).
- Separator nut (100).
- Separator split pin (92).
- Sight-bracket screws (180) (three).
- Sight-carrier pin (13).
- Slide (123).
- Slide cap (121).
- Slide-cap screw, large (138).
- Slide-cap screw, small (137).
- Slide-guide pin (80) (two).
- Slide-guide pin pins (86) (two).
- Slide spring (82).
- Spring screw (90).
- Spring-seat pin (43) (two).
- Stock (46).
- Stock bolt (91).
- Telescopic sight bracket (181).
- Trigger (65).
- Windage screw (126).
- Windage-screw collar (128).
- Windage-screw knob (124).
- Windage-screw pin (125).
- Windage-screw spring (127).

These parts are assembled into the following groups: The barrel group, the receiver group, the firing-mechanism group, the feed-mechanism group, the locking-mechanism group, the guard group, the stock group, the elevating-mechanism group, the hand-guard group, the barrel-rest group, and the rear-sight group.

#### THE BARREL GROUP.

[Plates V and VII.]

The barrel group contains the barrel, radiator, gas-nozzle ring, front-sight carrier, gas-cylinder support, regulator, and front sight, front-sight cover, front-sight screws, and cover screws.

The barrel is chambered and rifled the same as the barrel for the United States rifle, caliber .30, model of 1903. The rear portion of the barrel is turned down to provide seats for the radiator and the gas-nozzle ring, and the front end for the seat for the front-sight carrier. In rear of the radiator seat are the locking lugs, two interrupted annular rings divided into three sectors, which engage in similar lugs of the locking nut and secure the barrel to the receiver. On the lower exterior surface of the barrel and in the rear of these locking lugs is a small lug which fits in a slot in the receiver. This small lug assures the alignment of the receiver and the barrel, also of the gas-nozzle ring and the actuator. The rear end of the barrel is turned down for the ferreture nut, which fits over the end of the

PLATE II

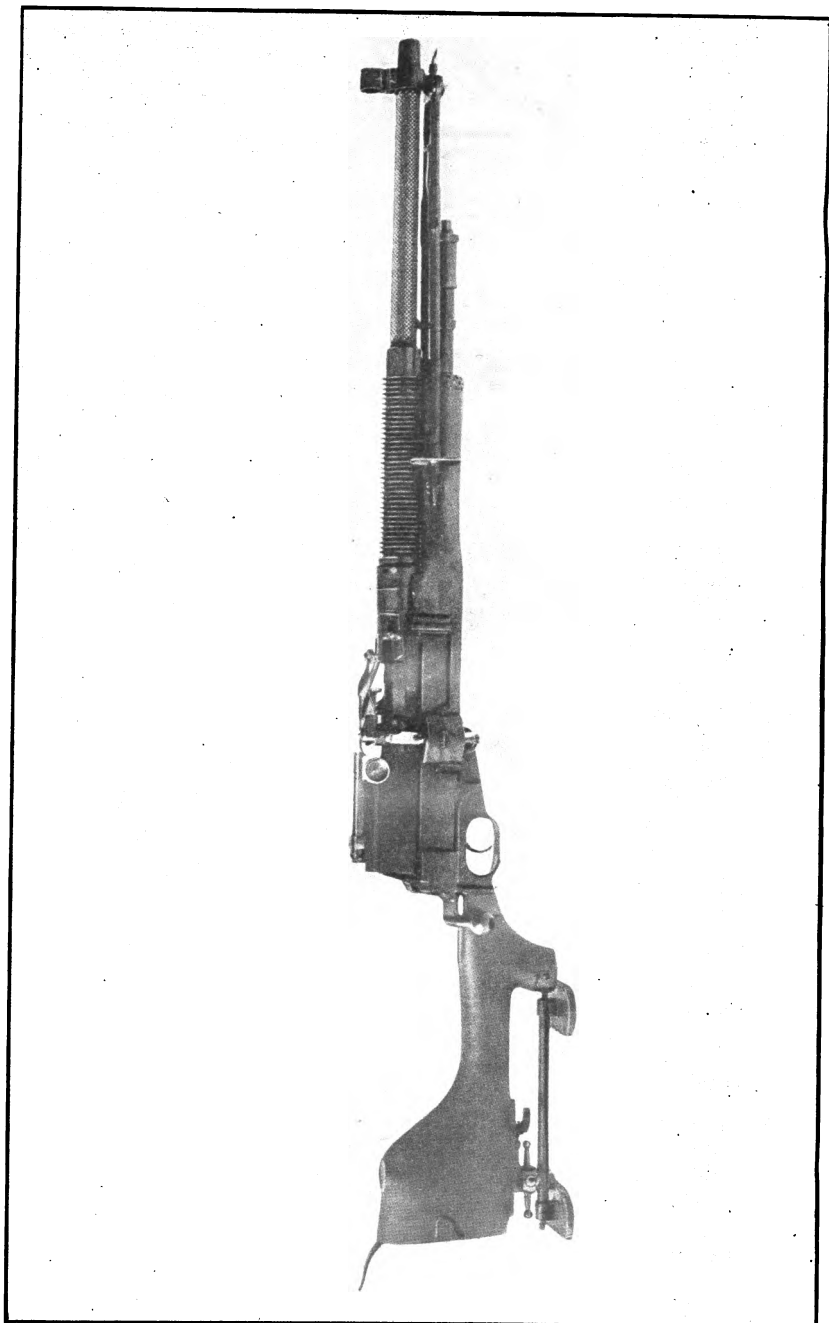
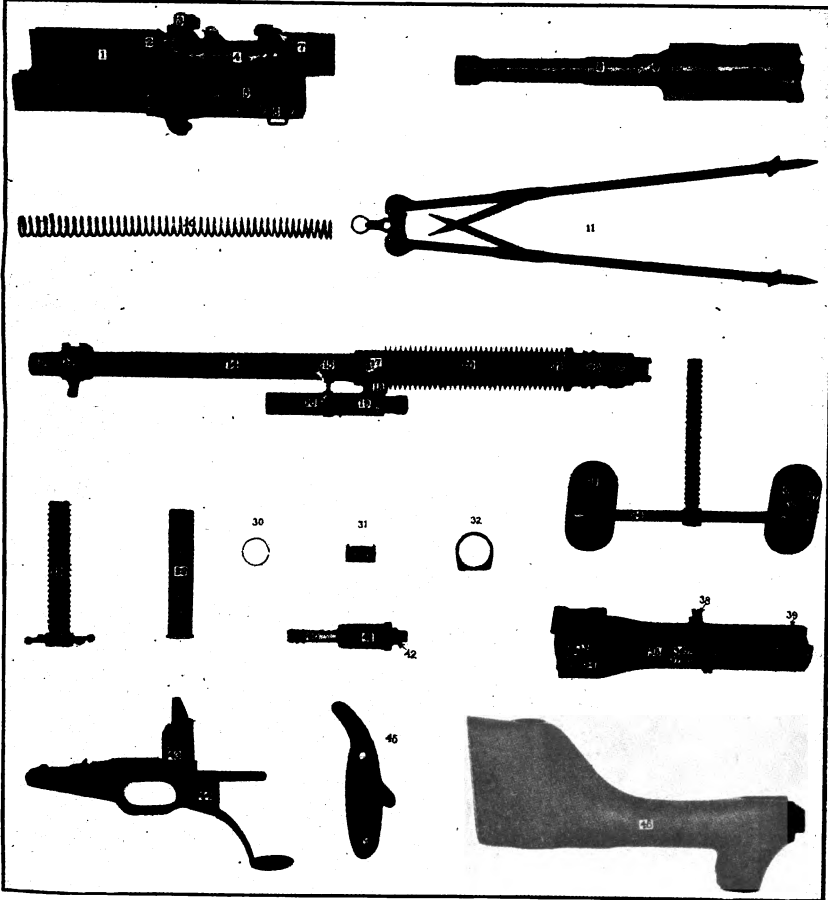
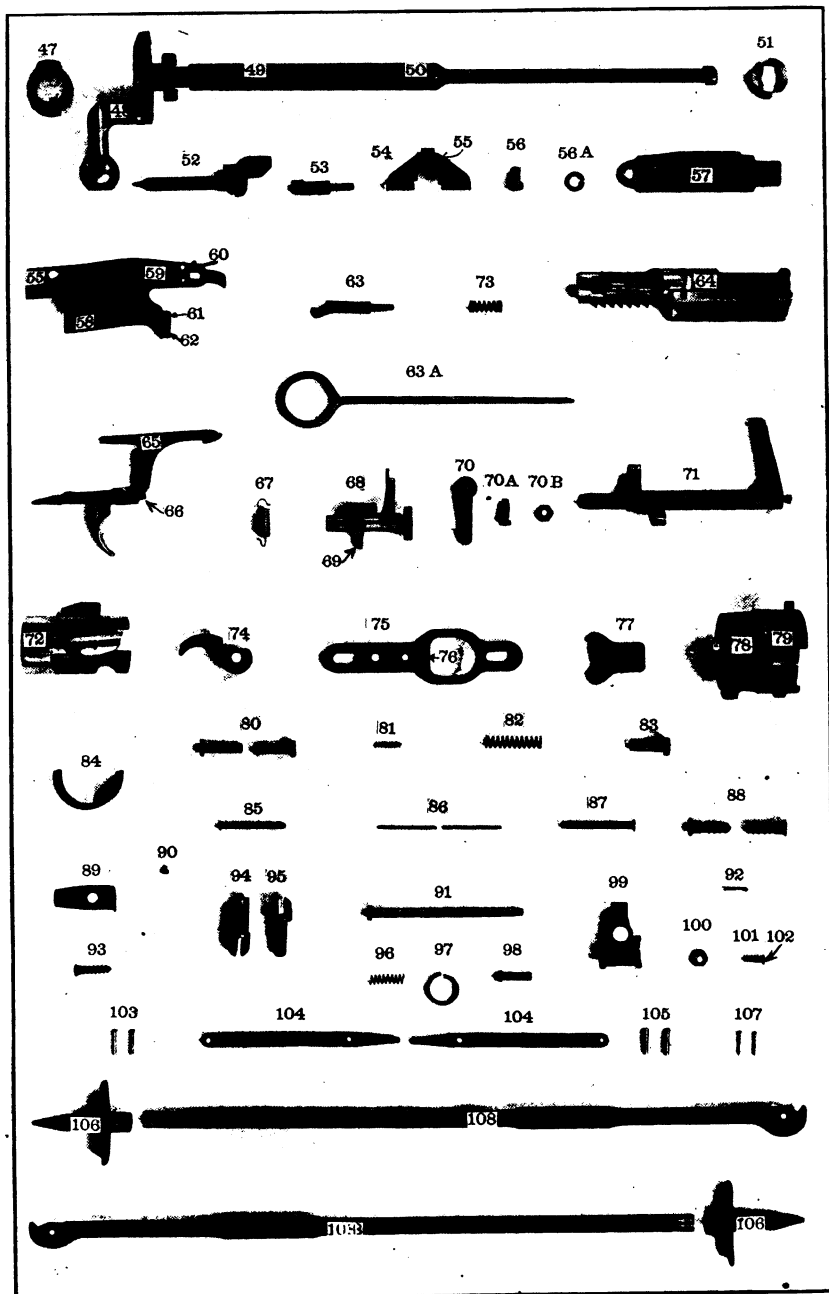


PLATE V





a cylindrical bar having on its rear end three annular piston rings which fit the gas chamber of the gas-nozzle ring. The purpose of these rings is to check the escape of gas to the front and thus to serve as air packing. The center section of the regulator piston is threaded to fit the thread in the gas-nozzle ring; its front end has a square head to aid in adjusting, disassembling, and assembling. The regulator sleeve fits the cylindrical part of the regulator piston in rear of the square head and is pinned thereto. The regulator sleeve covers the piston back to and including the thread on the center section, sufficient space being had between the regulator piston and the regulator sleeve to permit the front portion of the gas-nozzle ring to enter with a reasonably close fit. A tongue is milled in the barrel of the regulator sleeve and provided with a small projection on the inside, near the rear, which engages in a longitudinal groove on the underside of the gas-nozzle ring and prevents the sleeve from rotating after adjustment. The front end of the regulator sleeve is knurled, so that it can be more easily turned by the hand.

The purpose of the regulator is to increase or decrease the size of the gas chamber of the gas-nozzle ring, thus controlling the velocity of the rearward movement of the actuator in order to allow for adjustments for various powder pressures, or for difference in the friction of the parts.

The front sight has on its upper portion a thin leaf slightly beveled to the front, and on each side is cut a circular groove to better define the sight proper. On the lower portion is a dovetail lug which engages in the dovetail groove of the front-sight carrier. This method of assembling the front sight and front-sight carrier permits of adjustment for deflection, and after the rifle is targeted the hole in the front-sight carrier for the front-sight screw is extended into the front sight and the front-sight screw inserted. Over the front sight is placed the front-sight cover, secured by the cover screws.

#### THE RECEIVER GROUP.

[Plates V, VI, and VII.]

The receiver group consists of the receiver, ejector bushing, rear feed guide, front feed guide, bottom plate, feed-piece housing cover, and rear-sight fixed base; these parts constitute a receiver when issued, and are permanently attached to the receiver by rivets or screws. In assembling, components are assembled as follows: Closing spring, ejector, ejector spring, ejector cap, cartridge stop, cartridge-stop spring, cartridge-stop holder, cover plate, cover-plate washer, cover-plate screw, feed piece, feed-piece spring, windage screw, rear sight, telescopic-sight bracket, ferreture nut, and locking nut.

The receiver is a large steel forging, which contains the firing, feed, and locking mechanisms, and also provides means for the assembling

of the barrel, the guard, the hand guard, and the rear sight. In the front end of the receiver is drilled a large hole, which is the seat for the fermeture nut and the barrel. A slot on the lower side of this hole is for the purpose of locating the barrel and for assembling the fermeture nut. In rear of this slot is a recess for the lug of the fermeture nut. The front end of the receiver is threaded on the exterior for the locking nut, which secures the barrel to the receiver. On the top and directly in the rear are permanently assembled, by means of the feed-guide assembling screws, the front and rear feed guides, between which slides the feed strip during the firing. The front feed guide contains a narrow slot, in which the feed strip slides, and a large opening on the right for the cartridges. On top and at the right are two undercut slots, slightly beveled, into which is assembled the feed-piece spring. On the left is drilled and tapped a hole for the cover-plate screw. The rear feed guide has a narrow slot for the feed strip and also the cartridge opening on the right. On the left is a dovetail groove for the cover plate and on the right the seat for the feed piece. This seat consists of a hole drilled vertically in the rear feed guide with an opening in its rear for assembling the feed piece. A large lug to the left of this hole, on which the feed piece slides during the firing, and a smaller lug on the right inclose the seat. On top to the right of dovetail groove is an opening under large lug through which the feed-piece spring pawl passes in assembling.

The feed guides are braced on the left by the cover plate, which is secured to the front feed guide by the cover-plate screw and to the rear feed guide by the dovetail slot. The cover-plate screw is held securely by means of a split washer under head of screw, preventing its working loose from vibration in firing. On the front of the rear feed guide, just below and to the right of the dovetail slot, is assembled the cartridge base stop, which limits the movement of the cartridges to the left. In front of the rear feed guide is a tongue which enters between the feed strip and the cartridge and forces the latter downward. To the bottom and the front half of the receiver is securely riveted the bottom plate. The latter has on its lower surface two locking lugs, into which fit the trunnions of the guard. On top of the receiver and directly in rear of the feed guides is an undercut dovetail groove, in which is assembled the rear-sight fixed base, the latter being secured in position by the fixed base screw. The rear-sight fixed base contains the pivot lug for the movable base, the undercut for the windage screw and the lip on the front end of the movable base, and a lug on the rear end, which forms the undercut for the lip on the rear end of the movable base.

Upon its rear upper surface are two zero marks for the wind-gauge graduations. On the left side of the receiver is the ejection opening.



Above this opening is drilled and tapped the seat for the cartridge stop. In the rear of the ejection opening is the dovetail seat for the telescopic sight bracket, the latter being secured to the receiver by three sight-bracket screws. On the right side of the receiver is the feed-piece housing cover, which is attached to the bottom plate by the hinge pin. The former is held in its closed position by the closing spring which is inserted in the housing of the bottom plate. In the bottom of the housing of the bottom plate is drilled a small vertical hole in which is inserted the lower end of the feed piece. The ejector bushing is driven into a seat directly below the rear feed guide and has an opening on its left end for the ejector, while on the right are four small lugs, recessed to receive the lugs of the ejector cap.

The interior of the receiver has in its front section the seat for the fermeture nut, which is beveled in the rear to insure that the fermeture nut is always centered.

Within the rear section on the sides are the breechblock guide slots, while on the top and to the left is the guide for the firing pin which, ending in two cams, causes the firing pin to rotate in and out of its recess in the breechblock.

In the rear and bottom part of the receiver are the locking-lug seats for the guard.

On the left of the receiver near the rear end is a small hole, drilled and tapped, into which is screwed the locking screw for securing the guard to the receiver. A small slot in front holds the locking screw in place. Two beveled undercut grooves in the front of the receiver provide seats for the assembling of the hand guard.

#### THE FIRING-MECHANISM GROUP.

[Plates V and VI.]

The firing-mechanism group consists of the actuator, actuator spring, breechblock, firing pin, extractor, and extractor spring.

The actuator is located below and parallel to the barrel and is the piston which drives the mechanism of the rifle. It has on its upper surface a long straight cut and in the rear two diagonal cam cuts in which moves the lug of the fermeture nut. In the rear of these cams is cut a deep recess in order to reduce the weight of the actuator. In rear of this recess is a large lug, the center section of which is cut away for the lower lug of the firing pin. On the front end of the actuator is the gas cup, which fits over the nozzle end of the gas nozzle ring. On the right side of the actuator are two cam surfaces, upon which move the upper and lower lugs of the feed piece in recoiling and counterrecoiling. On the left side of the actuator is the clearance cut for the trigger, and on the bottom is the sear notch in which the sear engages when the rifle is cocked. On the lower surface

at the rear end is a slight ramp on which the sear rides near the end of recoil. On the right and left sides, and also on the lower surface of the actuator, are guides or bearing surfaces to control the movement of the actuator during recoil and counterrecoil.

The actuator is hollow nearly its entire length, the rear portion forming a housing for the actuator spring. About midway between the ends of the actuator is secured the actuator bushing. This bushing, which is threaded and screwed in position and secured with a pin, serves as the front seat for the actuator spring and also forms a seat for the lugs on the front end of the cocking handle when the latter is used to retract the actuator.

The actuator spring is a long spiral spring located in the interior of the actuator, with its front end resting against the actuator bushing and its rear end against the actuator spring seat in the guard. As the actuator recoils, this spring is compressed and the energy stored up is used to move the actuator forward at the end of the recoil.

The breechblock contains the firing pin, extractor, and extractor spring. The breechblock rests on the bottom of the guide slots in the receiver, the large lug on the actuator entering a long longitudinal slot in the rear part of the breechblock. At the rear end and left side of this long slot is a deep recess into which the upper lug of the firing pin rotates whenever the breechblock is in motion. In front of this long slot the breechblock is cut away as clearance for the cartridge stop, while at the top and rear end of the slot is a small ramp to aid in disassembling and assembling the firing pin. On the right and left sides of the breechblock at the rear are guides that move in the guide slots of the receiver. On the front section of the breechblock are interrupted threads divided into three sectors, which engage those of the ferreture nut and securely lock the former to the latter during firing. On the right side of the breechblock is a long clearance cut for the ejector. On the left-hand side of breechblock at the front end is the housing for the extractor; under this housing at the end of the breechblock is a stud, which acts as a seat for the curved surface on the bottom of the extractor at the rear of the extractor claw, preventing extractor from pitching too far toward center of breechblock to readily pass over cartridge case. On the inside of the housing a bevel cut is the working point for the bevel cut on top of the extractor when firing the rifle. The rear end of the housing forms a seat for the shoulder on the extractor after the extractor is worn on the bevel surface and on the bottom, thus increasing the life of the extractor. At the rear of the housing is a slot for the extractor and extractor spring; at the rear end of this slot is the extractor spring seat. On the left side back of the extractor spring seat the breechblock is cut away to facilitate the assembling and dismounting of the extractor and extractor spring.

At the front end of the breechblock on the upper rim a shallow seat is cut for carrying the cartridge into the chamber. The ends of rim on each side of ejector groove are slightly closed toward center of the breechblock to insure a good grip of cartridge case. The front end of the breechblock is counterbored for the head of the cartridge, and in the center of this space is drilled a small hole for the firing-pin point. The interior of the breechblock is bored out for the barrel of the firing pin.

The firing pin is seated within the breechblock. The front portion is cylindrical, terminating at the front end of the firing-pin point, and has on its rear end a small and a large lug. The small lug is on the underside and rests, when assembled, in the recess of the large lug on the upper part of the actuator. This small lug causes the firing pin to move to the rear in the first motion of recoil. The large lug is on the upper side and has on its top two cam cuts, which move in the cam cuts in the receiver and serve to rotate the firing pin in and out of the recess in the breechblock. The front shoulder of this upper lug rests against the front of this recess during counterrecoil and carries the breechblock forward, the upper lug on the actuator bearing against the rear end of the barrel of the firing pin. The bottom and rear end of the upper lug is beveled to permit assembling and disassembling.

The extractor is an irregular bar having on the underside of its forward end a claw and on the upper side of the forward end an incline which seats against the underside of extractor housing of the breechblock, when passing over rim of cartridge case. At the rear end of the extractor is a pivot on which the extractor spring seats and forces the extractor downward over the cartridge head. When the breechblock strikes the cartridge in loading, the extractor is forced backward until the claw drops into the cannellure of the cartridge.

The extractor is assembled to the breechblock by slipping the extractor spring over the pivot on the rear of the extractor, inserting the front end of the extractor in the opening in rear of the extractor housing and gradually forcing the extractor and spring into place with the dismounting tool. The position of the extractor is determined by the small bevel cut on top of the extractor, the convex cut on underside of extractor housing, and shoulder on the extractor.

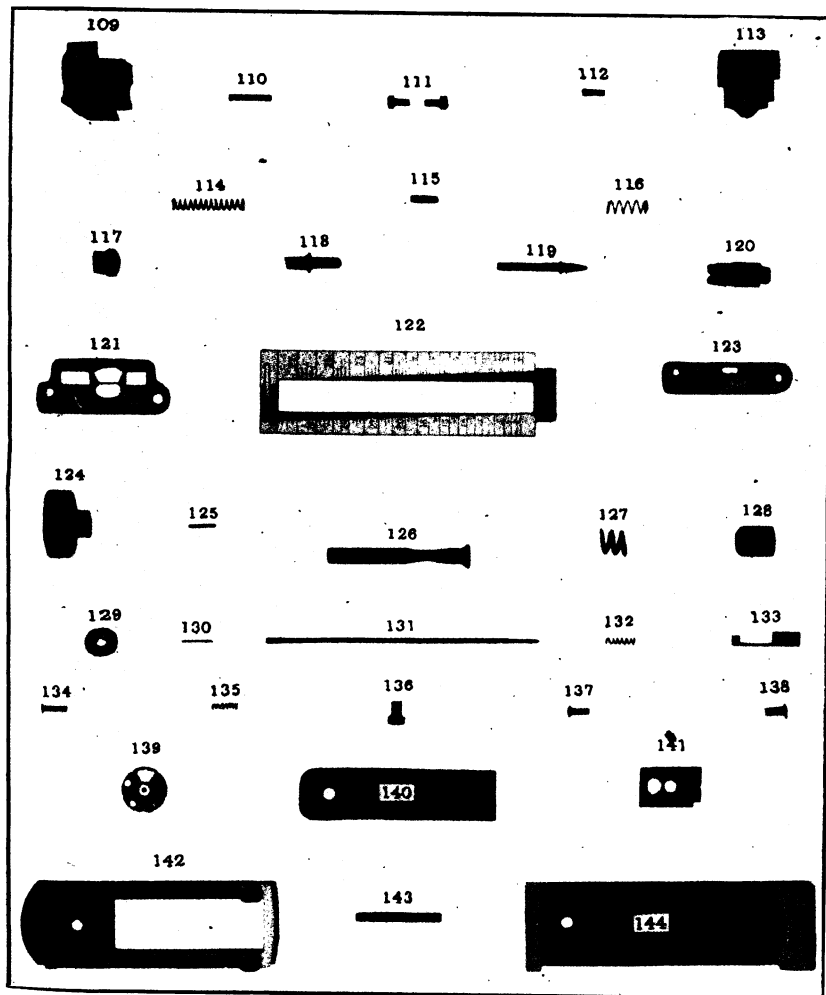
The pivot on the extractor is bent slightly, so the pressure of the extractor spring forces it into proper location. The extractor and spring may be dismounted either by use of the dismounting tool or by engaging a small screw driver behind the extractor spring in the small slot provided in the extractor seat of the breechblock.

The feed-mechanism group consists of the feed piece, the feed-piece spring, the cartridge stop, the cartridge-stop spring, the cartridge-stop holder, the ejector, the ejector spring, and the ejector cap.

The feed piece is of irregular shape, having at its upper end a feed arm, on the end of which is a pointed lug which engages in the central opening of the feed strip. On the top of the feed piece is a small lug, which holds the feed-piece spring in position. On the feed arm, near this lug, is a small cut into which the feed-piece spring stud drops when the feed arm is moved to the left. Near the lower end on the shaft of the feed piece are two lugs, one above the other, that move on the cam surfaces of the actuator and give rotation to the feed piece. When the last cartridge in a feed strip has been fired the feed piece drops down, due to pressure of the feed-piece spring, and the lower lug then prevents forward movement of the actuator. The lower end of the feed piece is cross milled to prevent the finger slipping when the feed piece is raised. Between the lugs and the feed arm a portion of the shaft is made flat, in order to facilitate assembling. The feed piece when assembled in the rifle is held in a vertical position by the opening in the bottom of the housing on the bottom plate and the circular opening in the rear feed guide on the receiver.

The feed-piece spring is an irregularly curved spring of sheet steel. On its front end is riveted the feed-piece spring button, for use in the disassembling and assembling of the spring, and at the rear and left side is riveted the feed-piece spring pawl. The latter is pointed on its left side; and as the feed strip moves to the left the feed-piece spring pawl engages in the rear openings of the strip, thus preventing the feed strip from moving to the right. On the right side, near the rear, is riveted the feed-piece spring stud, while directly in rear of this stud is a small opening through which passes the small lug of the feed piece. As the feed piece rotates, the upper surface of the feed arm strikes against this spring stud and slightly raises the feed-piece spring, thus allowing the pawl to ride over the feed strip. The feed-piece spring is assembled to the receiver by forcing it into the undercut grooves on the right side of the front feed guide.

The cartridge stop is a short cylindrical piece with a blunt conical point, and is seated in the receiver just above the ejection opening. It is held in position by the cartridge-stop spring and the cartridge-stop holder, the latter containing a small opening through which the end of the cartridge stop projects. The holder is also threaded for the purpose of assembling it to the receiver. The principal function of the cartridge stop is to act as a shock absorber. It also indicates, in loading, whether or not the feed strip has been fully inserted.





The ejector is assembled in the ejector bushing of the receiver and is held in position by the ejector spring and the ejector cap. The ejector cap is circular in shape, having on its circumference four small lugs which engage in corresponding slots in the ejector bushing. Special attention should be paid, in the assembling of the ejector cap, to insure that the small lugs on the sides of the cap are properly located in the slots provided for them in the ejector bushing; failure to properly locate these lugs will allow the ejector cap to jump out against the feed piece during firing and prevent the forward movement of the firing mechanism. On the top of the ejector cap are cut two slots at right angles to each other, into which fit the ejector key used in dismounting and assembling. In the center of the cap is a small hole which allows the end of the ejector to protrude.

#### THE LOCKING-MECHANISM GROUP.

[Plate VI.]

The locking mechanism group is made up of the locking nut, the fermeture nut, the locking nut screw, the check nut, and the locking screw. The action of the fermeture nut is an alternate locking and unlocking for each round fired, while the locking of the barrel to the receiver by the locking nut is more permanent in its nature.

The locking nut is cylindrical in shape, having two interrupted annular rings of three sectors each on the inside to provide means for locking the barrel to the receiver. In rear of these locking rings is cut the thread for assembling the locking nut to the receiver. Two small recess cuts are made on the front end of the locking nut for the dismounting wrench, and also a large cut for clearance and stops for the locking-nut stop on the radiator.

After the barrel is locked in position the locking nut is secured by the locking-nut screw and check nut. The locking-nut screw is inserted in a small hole tapped and drilled near the rear end of the locking nut on the left side. When the locking-nut screw is tightened it bears against the receiver and thus prevents any motion of the locking nut. After the locking-nut screw is tightened the check nut is set up, thus preventing the locking-nut screw from being loosened by the vibration. On the right side of the locking nut is the hand-guard stud, which holds the hand guard in place while the barrel is being removed. The locking nut is used for locking the guard to the receiver.

The fermeture nut is cylindrical in shape and has on its under side a large lug which moves in the cam cuts on the upper surface of the actuator. The front end of the fermeture nut is counterbored to receive the barrel, while directly in rear are interrupted threads divided into three sectors for locking the breechblock. The left

sector of the fermeture nut is enlarged to allow passage of the extractor housing of the breechblock. An enlarged recess is provided as clearance for the extractor housing as the fermeture nut rotates. Between the lower and right-hand sectors is a deep cut which provides a cavity into which primers may drop should they become dislodged from the cartridge case during firing. On top of the fermeture nut is a long longitudinal cut from the rear, providing clearance for the cartridge in loading; near the left rear end is a semicircular cut, providing clearance for the front clip of the feed strip; and on the top and right is the clearance for the feed strip. The rear shoulder of the fermeture nut is beveled to enter the corresponding bevel in the receiver. The function of the fermeture nut is to lock the breechblock at the instant of firing and to unlock it immediately after firing. The fermeture nut is located in the forward part of the receiver, directly in rear of the barrel, and is held by a shoulder on the barrel and a similar shoulder in the receiver, so as to prevent any longitudinal movement but to permit of rotation about its axis.

#### THE GUARD GROUP.

[Plates V and VI.]

The guard group consists of the guard, actuator-spring seat, latch spring, cocking handle, sear, sear spring, and trigger.

The guard, when assembled, closes the rear end of the receiver and supports the stock. It is secured to the receiver by trunnions on its front end which enter the locking lugs on the bottom plate, and also by locking lugs on each side in the upper part of the guard near the rear, which enter seats on the interior of the receiver. It is secured in its seat by one of the locking screws, which enters the guard through the locking-screw hole of the receiver. Within the guard is the recess and seat for the sear, and in the rear of this a long slot for the trigger. Under the latter slot is the trigger bow. In the upper part of the guard is a longitudinal hole in the top and bottom of which are two slots, in which the actuator-spring seat is placed. The latter is held in position by two large lugs on its perimeter and by two spring-seat pins which are assembled to the guard directly in front of the actuator-spring seat. Through the center of the actuator-spring seat is drilled and slotted a small hole with two small lugs 180° apart. Through this hole passes the shank of the cocking handle, the lugs sliding in the longitudinal grooves of the latter. Three semicircular grooves cross the rear surface of the actuator-spring seat, by means of which the cocking handle is locked into its three positions. In rear of the actuator-spring seat is the locking-lug seat of the cocking handle. Under the opening for the actuator-spring seat is a rectangular opening for the tongue of the trigger.



An arrow is stamped over the cocking-handle opening to aid in setting the latter in the desired position. On the rear of the guard is a short tang and a long tang, by means of which it is assembled to the stock. The latch spring is a flat steel spring assembled near the bottom of the long tang by the spring screw.

The cocking handle, consisting of the shank and knob riveted together, is located within the actuator and extends to the rear through the actuator-spring seat opening of the guard.

The front end of the cocking-handle shank extends into the actuator and terminates in a double-locking lug. In retracing the actuator by hand this lug bears against the actuator bushing. The rear portion of shank is provided with grooves which engage the two lugs on the interior of actuator-spring seat.

The cocking-handle knob has two locking lugs which serve to lock the guard to the receiver. These locking lugs are made with two projections which engage in the notches of the actuator-spring seat and thereby determine the position of "safety" or the kind of fire desired. On the rear of the cocking-handle knob is a circular disk, on the face and near the perimeter of which are stamped arrows which show the various firing positions. The position for firing automatically is marked "A," that for firing semiautomatically is marked "R," and that for safety is marked "S." An arm extends out from this disk with a ball handle by means of which the cocking handle is rotated into these positions and which also assists in dismounting and assembling. The disk of the cocking-handle knob is retained in position by means of two conical surfaces on its front face which engage in corresponding surfaces on the rear end of receiver. The disk of the cocking-handle knob has two notches cut therein. With the knob set at A, the position of the lower notch permits the tongue of the trigger to pass through, thereby allowing the trigger to be pulled directly to the rear. The hook on the forward end of the trigger engages the cocking arm of the sear, holding the cocking toe on the sear below the sear notch on the actuator. This position of knob will therefore give continuous or automatic fire.

With the knob set at R, the position of upper notch, which is provided with a cam surface, forces the tongue of the trigger downward as the trigger is pulled to the rear, thereby causing the trigger to release the sear for each shot. This position of knob will therefore give single shots. With the knob set at S, neither of the notches is opposite the tongue of trigger, and the latter can not, therefore, be pulled, and this position of knob is therefore known as the "safety position." With the knob set at C and D, the cocking handle can be drawn to the rear. This position of knob is used when it is desired to cock or draw back the actuator by hand and is also used when the mechanism is to be dismantled. To set for the different positions

the cocking handle is rotated until the particular letter corresponding to the position desired comes opposite an arrow marked on the guard.

The sear is made with a knurled button head and a spindle on which is the cocking toe, which engages in the sear notch of the actuator. The cocking toe has on its underside a deep recess; the spindle is made hollow and the head countersunk in order to reduce its weight. Underneath the cocking toe, assembled and riveted to the spindle, is the sear spring lever, by means of which the sear spring is attached to the sear. Between the cocking toe and the knurled button head is the cocking arm, which stands in an upright position when the sear is assembled in the guard. On its top is a small cut in which the hook of the trigger arm engages. On the spindle are two flat cuts by which the sear is dismounted and assembled.

The trigger is of irregular shape, having a trigger arm with a hook on its forward end which engages in the cut on the cocking arm of the sear. This arm extends to the rear sufficiently far to limit the motion to the rear of the trigger, and is connected to the body of the trigger by a curved arm which offsets the trigger arm to the left, so that it will clear the actuator. The body of the trigger has a circular bevel cut in the front end where the sear-spring pin is assembled. From the bottom of the body extends the finger piece which passes through the slot in the guard. On the rear of this body is a tongue having on its upper surface a small ramp. This ramp, when the trigger is pulled to the rear, slides into slots cut in the disk on the cocking handle, which permits the trigger to move straight to the rear or causes it to tilt slightly downward or prevent it moving at all. These are the positions of automatic *A*, semiautomatic *R*, and safety *S*, respectively.

#### THE STOCK GROUP.

[Plates V and VI.]

The stock group consists of the stock, latch plate, elevating-screw tube, and butt plate.

The stock is made of well-seasoned black walnut, cut down in front so as not to interfere with the sighting. It has a pistol grip and is recessed in front for the tangs of the guard, a small hole being drilled at an angle about midway in the recess for the lower tang of the guard for the guard screw, and a larger hole being drilled perpendicularly through the stock near the rear end of the recess for the upper tang for the stock bolt. In the bottom and rear of this grip is a small recess for the end plug, a shallow groove for the latch spring, and the seat for the latch plate, which is secured by the latch-plate screw, a transverse hole being drilled for that purpose. In the rear end of the stock is assembled the elevating-screw tube with

cap, in a hole drilled for this purpose, and the lower end is then spun out over the washer. In the bottom and rear of the stock are drilled two holes for the slide-guide pins and two smaller transverse holes, through the above holes, for the slide-guide-pin pins. Between the large holes and in front of the elevating-screw-tube opening is cut a small recess for the slide spring. On the front end of the stock is a small tenon which extends into the guard, taking the shock of recoil in firing.

The butt plate has two side tangs and is secured to the butt of the stock by one butt-plate screw which passes through the tangs, and by two butt-plate wood screws. Holes are drilled in the rear end of the stock for the wood screws and a smaller hole is drilled through the stock near its rear end for the butt-plate screw. On the upper end of the butt plate is a long tang for supporting the weight of the rifle on the shoulder when firing without the elevating mechanism.

#### THE ELEVATING-MECHANISM GROUP.

[Plates V and VI.]

The elevating-mechanism group consists of the inner elevating screw, the outer elevating screw, and the elevating-screw slide.

The inner elevating screw consists of the elevating-mechanism guide rods, the end plugs, the elevating-mechanism feet, and the inner elevating screw. The elevating-mechanism feet are flat pieces, oblong in shape, having on the top a large lug to which the elevating-mechanism guide rod is assembled. On the underside is a large recess, in the center of which is a small conical lug to prevent slipping. The end plugs are notched on the top so as to engage in the latch plate on the stock and thereby secure the elevating mechanism when in the traveling position. On the elevating-mechanism guide rod is assembled the inner elevating screw, and to its ends are riveted, by means of the elevating-mechanism foot pins, the end plugs and the elevating-mechanism feet. The body of the inner elevating screw is hollow, in order to reduce its weight, and has cut on its exterior a right-hand thread. At the lower end is a square head, through which a small hole has been drilled for the elevating-mechanism guide rod.

The outer elevating screw has on the exterior of its body a left-hand thread extending nearly to the bottom. On the lower end are four radial arms by means of which the outer elevating screw is rotated. On the interior of the body, near the bottom, is cut a right-hand thread to fit the corresponding thread on the inner elevating screw. Below and above this thread the interior is counterbored for clearance.

The elevating-screw slide is designed to lock the elevating mechanism when firing, and consists of the elevating-screw slide, the binder, the binder lever, the binder-lever pivot, and binder spring. To the elevating screw slide are assembled the parts just mentioned. Slightly in the rear of its center is the elevating screw opening, the rear end of which forms a half nut, which engages in the thread of the outer elevating screw. In front of this opening is a dovetail groove for the binder. In the rear end of this groove is assembled the elevating screw slide pin against which rests the binder spring, while in the front part is drilled a small hole for assembling the spring. In front of the binder slot is also drilled a hole into which is driven the binder lever pivot. Near each end of the elevating screw slide are the slots for the two slide guide pins, which secure the elevating screw slide to the stock. After the slide guide pins have been assembled the slide guide-pin pins are driven transversely through the stock and through a small hole in the slide guide pins, thereby securing the latter in position. In the recess of the stock under the elevating screw slide is assembled the slide spring.

The binder has on its upper side a dovetail lug containing a recess for the binder spring and the rear end is made to fit the body of the outer elevating screw. The binder is assembled to the elevating screw slide by means of the dovetail lug engaging in the corresponding groove on the slide.

The binder lever has on its left side a circular cam surface which moves against the front end of the binder. In the center of the circular cam surface is drilled a hole for the binder lever pivot, and to the right extends the lever arm, which is curved to the front so as to fit the finger. The rear of this arm is cross milled to aid in operating the clamping device. A small lug on the upper surface of the binder lever limits the motion of the lever arm to the rear.

The binder lever pivot is the axis for the binder lever, and has its upper end turned down so as to have a driving fit in the pivot hole of the elevating screw slide, while its lower end forms an eccentric about which the binder lever rotates; the purpose of the eccentric being to take up the wear between the binder and the binder lever. On the bottom or head of the pivot is stamped an arrow which indicates the high point of the cam.

The outer elevating screw can be quickly inserted into or removed from the stock by drawing the elevating screw slide to the rear by the binder lever. In the traveling position the elevating mechanism is secured in front by the end plug engaging the latch plate on the stock and in the rear by the clamping device.

## THE HAND-GUARD GROUP.

[Plate V.]

The hand-guard group consists of the hand-guard body, front and body stiffening pieces, assembling plates, leg catches, and leg catch springs.

The hand-guard body is made from a drawn-steel tube or from sheet steel pressed to shape and brazed. It is reinforced at the front end by the front and the body stiffening pieces which are securely riveted and brazed to the hand-guard body. In the forward part of the hand-guard body are punched a number of small holes which permit the powder gases to escape after impinging on the actuator. On the rear end of the hand guard are riveted the two assembling plates which seat in the undercut grooves in the front of the receiver. On each side of the hand guard are riveted the leg catches, under which the leg-catch springs are assembled. These catches support the front legs of the barrel rest when in the traveling position. When assembled the hand guard is held in position by the undercut grooves in the front of the receiver and the horizontal lug on the upper part of the gas nozzle ring. The purpose of the hand guard is to protect the gunner from escaping gases and also to provide protection from the moving actuator, thus insuring that all moving parts of the rifle are inclosed.

## THE BARREL-REST GROUP.

[Plates V and VI.]

The barrel-rest group is made up of the following principal parts: The barrel-rest head, the plunger, the connecting piece male, the connecting piece female, the front legs, the front-leg feet, and the separators.

The barrel-rest head is a steel piece which serves as a sleeve to the connecting pieces, male and female, and into which the plunger, plunger ring, and plunger spring are assembled. In the body of this head are two holes, one being a small, vertical hole for the pivot on the front sight carrier and the other a larger transverse hole for the male and female connecting pieces. On the top at each side the body of the head is cut away for the lug on the top of the front leg. In front of the pivot hole is drilled a longitudinal hole in which is assembled the plunger and plunger spring. The plunger secures the barrel seat to the pivot at the bottom of the front sight carrier. The plunger is held in place by the plunger ring, the latter being assembled through a hole in the front part of the plunger.

The connecting piece, female, is drilled and tapped on one end to match the thread which is cut on the body of the connecting piece, male. The outer ends of both connecting pieces are slotted for the front legs. The connecting pieces are assembled in the barrel-rest

head, the front legs are then inserted into the slots and riveted in position by the front-leg axis.

The front leg is a long bar having at the top a flat lug. A notch is cut across this lug which bears against the connecting piece, and the barrel-rest head when the front legs are extended, and a hole is drilled through this lug for the front-leg axis. Above the center of the front leg is a section, larger in diameter than the remainder of the bar, in which is cut a deep slot for the separators, and at right angles to this slot is drilled the separator axis hole. At the lower end of the front leg is riveted, by the foot rivet, the front-leg foot, the latter being made with a flat plate, which prevents the front leg from sinking in soft ground.

The separators which hold the front legs in the extended position are riveted to the front legs by the separator axes. The separators are secured to each other by the separator bolt. The separator bolt is secured by the separator nut and the latter by the separator split pin. A small lug on the end of each separator enters a slot in the other separator and holds the legs extended.

#### THE REAR-SIGHT GROUP.

[Plate VII.]

The rear-sight group is made up of the following principal parts: The movable base, the base spring, the leaf, the elevating screw, the slide, the half nut, the slide cap, the drift slide, the aperture disk, and the windage screw.

The movable base has on its upper surface two ears in which are the holes for the joint pin which serves as a hinge for the leaf. On the rear end of the movable base are the wind-gauge graduations, each point of which corresponds to a lateral deviation of 4 inches for each 100 yards. Both ends have lips which fit the undercuts of the fixed base, the front lip having also a worm gear for engaging the thread of the windage screw. The base spring fits in the spring seat of the movable base.

The leaf is graduated from 0 to 2,800 yards. On the right side of the sighting opening in the leaf is the groove and seat for the elevating screw, which is a long, thin screw, extending from the bottom of the sighting opening to the top of the leaf, where it is secured in the elevating screw head by the elevating screw pin. This elevating screw allows minute corrections for elevation and also holds the slide in position on the leaf by means of a half nut which is seated in the slide and the half-nut spring, the latter forcing the half nut against the thread on the elevating screw. The outer end of this half nut is knurled, and by pressing in on the knurled head the half nut can be released from the elevating screw and the slide quickly raised or lowered.

The rear face of the slide is cut out for the leaf, and the drift slide and the right half is made with a seat for the half-nut spring and the half nut. The right and left ends are drilled and tapped for the small slide-cap screw and the large slide-cap screw, which secure the slide cap to the slide. The front face of the slide is slotted and recessed for the pivot.

The slide cap has a circular cut in its upper surface which forms a recess for rotating the aperture disk, and also apertures for sighting and for reading the graduation on the leaf. The center is slotted for the pivot. On the right and left sides are drilled the holes for the small and large slide-cap screws. On the rear face at the bottom of the slide cap is the open or battle sight.

The drift slide moves in the drift slots in the leaf. At the top is a small open sight, while just below are two openings, the upper for the pivot and circular lug on the aperture disk and the lower for a sighting aperture. The drift slide is held in place by a lug on its front face, which bears against the slide and by the lug which contains the open sight. This latter lug extends to the rear and bears against the top of the slide cap. On the lower edge of the open-sight lug is another small lug, which engages in the notches on the perimeter of the aperture disk, locking the latter in the desired position.

The aperture disk is a circular piece containing five sight openings, viz: Four peepholes, 0.04, 0.06, 0.08, and 0.10 inch in diameter, and one large aperture which contains an open sight. A circular lug on the front face engages in the central opening of the drift slide, thus causing the aperture disk to conform to the movement of the former. This lug is drilled and tapped for the pivot spring and the pivot. The purpose of the pivot spring is to force the aperture disk to the rear, so that one of the notches, which are cut on its perimeter, will engage in the small lug on the drift slide and prevent rotation. By pressing inward, the aperture disk can be released and rotated until the desired aperture is opposite the sighting opening in the drift-slide.

The windage screw consists of the windage screw, the windage screw knob, the windage screw collar, the windage screw spring, and the windage screw pin. It is seated in the front part of the fixed base.

#### DISMOUNTING AND ASSEMBLING THE RIFLE.

The rifle should not be assembled or disassembled except under the direct supervision of an officer or a competent noncommissioned officer.

Metal parts should not be struck directly with a hammer. If it is necessary to strike any part of the rifle, interpose a buffer of wood or copper between the parts struck and the hammer.

The firing mechanism of the rifle can be disassembled with the rifle resting on the barrel rest and the elevating mechanism feet, but for convenience it should be placed on box or bench. For the ordinary dismounting that may be necessary to replace spare parts no tools are required except a dismounting wrench when it is necessary to replace a ferreture nut. To replace the barrel, ejector, and cartridge stop, special tools are, however, necessary, and these are furnished with the accessories. The rifle is disassembled as follows:

(1) *Let down the firing mechanism*, if the rifle is cocked. Place the thumb of the right hand on the top of the feed-piece housing cover and with the forefinger on the bottom of the feed piece raise the latter to its highest position. Set the cocking handle at any of the positions for firing, and pull the trigger.

(2) *Remove the cocking handle*.—This is accomplished by rotating the cocking handle until the cocking-handle knob is just beyond the vertical position, as indicated by the arrow. Draw the cocking handle directly to the rear for about one-half inch and then rotate it about  $45^\circ$  to the right, until the lugs of the actuator-spring seat come up against the side of the dismounting slot in the cocking-handle shank. The cocking handle is now free to be withdrawn from the guard.

(3) *Remove the guard*.—Unlock the guard by unscrewing the locking screw on the left side of the receiver. Grasp the bottom of the receiver in the left hand and the small of the stock with the right, then push the stock forward about three-eighths inch and then straight downward, and remove from the receiver.

(4) *Remove the actuator spring*.

(5) *Withdraw the actuator from the receiver*.—Insert the cocking handle into the actuator until the lug on the front end of the cocking handle is engaged in the actuator bushing. Draw the actuator to the rear.

(6) *Remove the breechblock, firing pin, and extractor*.—Lift the breechblock from its seat on the actuator. Draw the firing pin to the rear and by tapping the breechblock on its base the firing pin can be removed from the breechblock. The extractor and spring are removed by inserting the dismounting tool (claw to the front) in rear of the extractor spring, and then rotating the dismounting tool through an angle of  $180^\circ$ , at the same time pressing downward and backward until the spring flies out of its seat. The extractor is then pulled out to the rear. This is most conveniently done by holding the breechblock in the left hand, head of block pointing to the front, and manipulating dismounting tool with the right hand. Care should be taken to avoid slipping of the dismounting tool, as by its careless use a severe cut may be inflicted on the hand. In assembling the extractor and spring it is best to so place the spring that one end of the rear coil comes at the bottom part of the extractor-spring seat, in



the breechblock. This allows a slight opening between the upper part of the extractor spring and extractor-spring seat, so that the point of the dismounting tool can be more readily inserted behind the spring.

(7) *Remove the feed-piece spring.*—With the left hand raise the rear of the feed-piece spring until it is free of the small lug on the top of the feed piece. With the right hand grasp the feed-piece spring button and draw the spring directly to the rear. In case the spring can not be easily removed it can be best accomplished by gently tapping the feed-piece spring button with the handle of a screw driver.

Care must be taken to see that the feed-piece spring pawl on the left of the feed-piece spring is clear of the rear feed guide before attempting to remove the spring.

(8) *Remove the feed piece.*—Open the feed-piece housing cover and raise the sight. Then grasp the feed arm of the feed piece, raise, and rotate the latter through 180°. Remove the feed piece by withdrawing the flattened part of the shaft through the opening in the rear feed guide.

(9) *Remove the ejector.*—Release the ejector cap by pressing downward with the ejector key and then rotate the cap through one-eighth of a turn. Remove the cap and the ejector spring and then withdraw the ejector.

(10) *Remove the barrel.*—This is accomplished by first backing off the check nut slightly, then loosening the locking nut screw about one turn. By means of the dismounting wrench then rotate the locking nut until the hand-guard stud strikes against the hand guard, grasp the barrel with the right hand and the receiver with the left hand and draw the barrel straight to the front.

*Do not attempt to operate the breech mechanism when the barrel is disengaged, since the fermeture nut is not held under this condition and the threads of the breechblock may jam.*

(11) *Remove the hand guard.*—Rotate the locking nut to the left by means of the dismounting wrench until the hand-guard stud is free of the hand guard. Remove the hand guard from its seat in the receiver.

(12) *Unscrew and remove the locking nut* from the receiver.

(13) *Remove the fermeture nut.*

(14) *Remove the cartridge stop.*—Unscrew the cartridge-stop holder by means of the dismounting wrench. Then withdraw the cartridge-stop spring and the cartridge stop.

(15) *Remove the cover plate* by unscrewing the cover-plate screw, using the screw-driver end of the dismounting wrench. Remove the cover-plate screw washer and drive the cover plate directly to the front.

(16) *Remove the sear, sear spring, and trigger from the guard.*—To remove the sear, disengage the cocking arm of the trigger from

the sear, grasp the knurled head of the latter with the left hand, the right holding the guard. Then rotate and draw it outward until the flattened portion of the sear is opposite the cut in the guard, when the sear may be lifted from its seat. The trigger is then removed by drawing the latter upward and then forward. Separate the sear and trigger by detaching the sear spring from each.

In removing the trigger, care should be exercised that the arms of the trigger do not become jammed or bent during dismounting, as this part is comparatively fragile and can be easily deformed by excessive force, thus causing improper engagement of the trigger arms with the cocking handle and sear.

(17) *Remove the inner and outer elevating screws.*—Release the end plug from the latch plate by grasping the front end of the guide rod firmly, press downward, at the same time drawing directly to the rear. Unlock the outer elevating screw by rotating the binder lever from front to rear. Draw the slide by means of the binder lever directly to the rear. The outer elevating screw with the inner elevating screw are then free to be removed from the stock.

(18) *Remove the stock.*—This is accomplished by removing the stock bolt and the guard screw.

(19) *Remove the elevating-screw slide.*—Drive out the slide-guide-pin pins and then remove the slide-guide pins, by prying upward under head of slide-guide pin with end of a small screw driver, placing some thin material between the screw driver and elevating screw slide to avoid mutilation of the grooves for the slide-guide pin. The slide-guide pins are slotted for the purpose of placing the pinhole of the latter in prolongation of the pinhole in the stock.

(20) *Remove the slide spring.*

(21) *Remove binder lever and binder.*—The binder is removed by driving out the binder lever pivot. Then remove the binder spring by compressing the spring sufficiently to allow the pointed end of a small wire to be inserted between the upper last coil of the spring and edge of small hole in the slide. Pressing the wire at an angle from the end of the spring will cause it to fly out of the slide and onto the wire, through the small opening in the bottom of the elevating-screw slide. The binder is then easily removed.

NOTE.—*The binder lever pivot should not be removed unless necessary, as this part is a driving fit and removing it will cause it to become loose so that it may drop out from the vibration of firing.*

The barrel rest, the regulator, the butt plate, the latch plate, the latch spring, the front sight, the rear sight, and the rear-sight fixed base can be removed without further instructions.

The remaining parts are riveted and pinned and should not be disassembled except at an armory or by a skilled workman with proper tools.

(1) Assemble the binder, the binder spring, the binder lever, and the binder-lever pivot to the elevating-screw slide.

(2) Assemble the butt plate, the latch plate, the elevating-screw slide, and the guard to the stock.

(3) Assemble trigger, sear spring, and sear to the guard.

(4) Assemble the closing spring, cover plate, cover-plate screw washer, and cover-plate screw, fermeture nut, locking nut, the hand guard, barrel, ejector, ejector spring, ejector cap, feed piece, feed-piece spring, cartridge stop, cartridge-stop spring, cartridge-stop holder, rear-sight fixed base, fixed-base screw, and rear sight to the receiver, in the order mentioned.

On the inside of the ejector bushing between the grooves for assembling the ejector cap are four U-shaped recesses to receive the small lugs on the sides of the ejector cap. Care must be taken in assembling to make sure that these small lugs are properly located in the recesses provided for them, which can be determined by trying the ejector cap with the ejector key. If the cap does not turn without downward pressure the lugs are properly engaged. If the cap is not properly located the action of the breechblock on the ejector when firing the rifle causes the spring to force the ejector cap outward against the feed piece at an angle which causes the ejector cap to act as a wedge between the end of the ejector and the feed piece and will prevent the forward movement of the firing mechanism.

Care must be taken in assembling the fermeture nut that the proper end is inserted and that the lug is turned to the left into the recess in the receiver.

The receiver should be assembled to the barrel before assembling the firing mechanism to the guard. If the receiver is not assembled to the barrel the fermeture nut is not held in place, and by letting the firing mechanism down with the fermeture nut displaced a jam of the teeth of either the fermeture nut or breechblock may be caused.

(5) Assemble the extractor, extractor spring and firing pin to the breechblock and place the latter on the actuator and insert in the receiver. In placing the breechblock on the actuator see that the upper lug of the firing pin is in the recess on the left of the breechblock. In inserting the actuator care must be taken that the actuator is forced fully home, otherwise trouble will occur in the assembling of the guard, due to the buckling of the actuator spring. While inserting the actuator in the receiver, raise the feed piece to its highest position with the right hand.

(6) *Insert the actuator spring.*—If the actuator is fully seated the spring will not protrude beyond the receiver more than half an inch. Should the spring extend farther, it should be taken out and the actuator seated properly by the aid of the cocking handle. A weak

actuator spring can usually be detected by its failure to protrude slightly beyond the rear end of the receiver when assembling.

(7) *Assemble the guard.*—Grasp the small of the stock with the right hand and the receiver with the left. Carry the guard forward until the actuator spring rests upon the actuator-spring seat. Then, holding the guard as close to the receiver as possible, force the former forward until the trunnions slip into the locking lugs on the bottom plate of the receiver. At this instant, raise the guard and draw the latter back into its seat. Care must be taken not to buckle the actuator spring, since this will interfere with the assembling of the cocking handle. In the case of a stiff spring, the cocking handle may be partially inserted into the guard before assembling the latter.

(8) Insert the cocking handle in a manner the reverse of disassembling, thus locking the guard and receiver together while putting in the locking screw. If the locking screw is inserted before the cocking handle, the guard is liable to slip forward slightly, allowing the sharp end of the locking screw to shave and elongate the hole in the guard, resulting in a looseness between the guard and receiver while cocking the rifle by hand.

(9) Assemble the barrel rest and the elevating mechanism.

#### REPLACING EXTRACTOR OR EXTRACTOR SPRING.

The replacing of the extractor or extractor spring when the rifle is dismounted is explained on another page. If the rifle is mounted and it is desired to replace only the extractor or extractor spring, it can be done as follows:

- (1) Let down mechanism if the rifle is cocked.
- (2) Pull back the breechblock by means of the cocking handle until the extractor is in the middle of the ejection opening of the receiver. (Cocking handle can be retained in this position by placing a live or fired cartridge between the end of cocking handle and guard so that it is not necessary to hold it back with the hand.)
- (3) Insert the dismounting tool in rear of spring and remove the extractor and extractor spring.
- (4) Replace with new extractor, extractor spring or both, and let the firing mechanism go forward.

#### REPLACING FIRING PIN OR BREECHBLOCK.

- (1) Let down the mechanism if rifle is cocked.
  - (2) Remove cocking handle.
  - (3) Remove the guard.
  - (4) Remove the actuator spring.
  - (5) Withdraw the actuator.
  - (6) Remove the firing pin or breechblock and replace.
- Assemble in an order the reverse of disassembling.

## REPLACING THE FEED PIECE AND THE EJECTOR.

- (1) Proceed as in the case of exchanging the firing pin up to and including the removal of the actuator.
- (2) Remove the feed-piece spring.
- (3) Remove the feed piece.
- (4) Remove the ejector cap and spring and then replace the ejector with a new ejector.

Assemble in an order the reverse of disassembling.

## REPLACING THE FERMETURE NUT.

- (1) Proceed as in the case of exchanging the firing pin, up to and including the removal of the actuator.
- (2) Remove the barrel.
- (3) Remove the hand guard.
- (4) Remove the locking nut.
- (5) Remove the fermeture nut.
- (6) Replace new fermeture nut and assemble in an order the reverse of disassembling.

## OPERATION OF THE RIFLE.

Ordinarily the rifle will be operated by two men, a gunner who will sight and fire the piece, reduce jams, etc., and a loader, who will insert the feed strips and assist the gunner in reducing jams, etc.

## TO PREPARE THE RIFLE FOR FIRING.

- (1) Remove the rifle from the pack.
- (2) Free the front legs from the catches in the handguard.
- (3) Carry the legs forward until they are at right angles to the barrel, and then by a quick movement separate the legs to their full extent. Place the legs so that the muzzle points in the desired direction and force the feet into the ground.
- (4) Raise the rear sight leaf. Cock the rifle by rotating the cocking handle knob to the vertical position and then drawing it to the rear until the sear engages in the sear notch of the actuator.

After the rifle has been aimed care must be used not to derange the aim or move the rifle in cocking. The gun can be cocked with the least disturbance of aim if the loader will hold down the rifle by placing his right hand on the barrel above the radiator while the gunner cocks the piece. As the barrel may be hot the loader uses an asbestos glove on his right hand. The gunner grasps the outer elevating screw with his left hand and the cocking handle with his right hand. He turns slightly on his left side, holds the gun steady with his left hand, and snaps back the cocking handle with a quick motion of the right hand, cocking the gun.

(5) Push the cocking handle forward, turn it to the right, and set at "S." safety, until ready to fire.

(6) Remove feed strips from the ammunition box and place conveniently for loading.

(7) Set the sights as directed.

#### TO LOAD.

(1) Raise the feed piece to its highest position.

(2) To load the piece the gunner places the left hand on top of the receiver over the rear feed guide, with the index finger on the cartridge stop and the thumb on the rear feed guide at the right side of the gun. With the index finger he can tell when the gun is loaded and the position of the thumb serves as a guide for locating the strip in night loading. He then inserts the loaded feed strip into the feed guide with the left hand, bearing down on the outer end to be sure that the front edge of the feed strip does not get below the front feed guide, and then pushes the feed strip to the left until the cartridge is against the cartridge stop, which can be determined by the protrusion of the cartridge stop from its holder. The pawl on the feed-piece spring should then drop into the notch in the feed strip, holding it in the loaded position.

#### TO FIRE.

Aim the gun at the target as follows:

(1) Unlock the elevating mechanism by rotating the binder lever to the right and rear, raise or lower the stock to approximately the proper elevation. Release the elevating screw slide, adjust the outer elevating screw to the proper elevation, and clamp by pushing the binder lever forward.

(2) Turn the cocking handle to "R," repeat, or "A," automatic, and fire the piece by drawing the trigger directly to the rear.

(3) Release the trigger when it is desired to stop the fire.

(4) Cool the barrel when necessary. This should be done after about three hundred rounds of continuous firing. In cases of necessity the rifle may be fired one thousand rounds without cooling, without serious injury to the barrel, but this should be avoided as far as possible.

#### PREPARING THE RIFLE FOR PACKING.

(1) Remove feed strip from rifle if partially fired. This can be accomplished by first cocking the rifle, then with the right hand pressing upward on the lower end of the feed piece until the pawl of the feed-piece spring is clear of the feed strip. With the left hand withdraw the strip from the rifle.

- (2) Let down the mechanism.
- (3) Lower the rear-sight leaf.
- (4) Secure the elevating mechanism in the traveling position.
- (5) Close the front legs and engage the latter in the leg catches on the hand guard.

#### GENERAL INFORMATION CONCERNING THE USE OF THE RIFLE.

##### STEADYING THE RIFLE FOR ACCURACY.

On account of the very light weight of this rifle considerable vibration in firing is sometimes experienced unless the mount is properly used. A leather latigo strap 8 feet long by  $\frac{3}{4}$  of an inch wide is issued with each rifle. By tying this strap to the lower end of one foot of the barrel rest and passing it through the trigger bow of the guard and securing the other end to the other foot of the barrel rest in such a manner that when the strap is pulled taut the barrel rest will be inclined slightly backward from the ground toward the muzzle, like the front two legs of a tripod, a very secure support for the muzzle is obtained. In the absence of a strap an ordinary cord will answer as well.

In yielding ground additional steadiness can be obtained by driving two bolos or bayonets into the ground, at an angle, behind the front legs and over the strap.

##### ADJUSTMENT OF THE GAS REGULATOR.

For this rifle to operate at all it is essential for the gas to be adjusted properly. Most of the trouble which inexperienced operators have found in operating this rifle is due to failure to properly adjust the gas setting.

There is no normal setting for the regulator, as the setting varies in individual guns according to the amount of lubrication, wear of the parts, stiffness of the springs, resizing of the feed strips, and other conditions which may cause a variation in the amount of power required to operate the weapon. *Use only sufficient gas for the proper operation of the mechanism and no more.* The maximum effect of gas on the actuator occurs with the regulator set at zero.

To determine the proper setting of the regulator for any gun proceed as follows: Place the gun on the ground in the firing position and load. Set the gas regulator at 4.0 and turn the cocking handle to "R." Fire one shot. If the amount of gas is not sufficient the actuator will not be driven all the way back and the gun will fail to eject the empty cartridge. Cock the gun, clear the empty shell from the ejection opening, push the feed strip over if necessary, screw down the regulator one or two turns, and repeat the test until

the gun fires a single shot for each pull of the trigger and gives a good free ejection. Then turn the handle to "A" and fire several shots to see that the gun is not racing. In the operation of adjusting the gas a point will sometimes be reached where there is just sufficient gas pressure to blow the actuator back far enough to eject the empty shell and feed the fresh cartridge but not far enough for the actuator to catch on the sear. In this case the gun will fire automatically with the cocking handle set at "R." This condition is a sign of too little gas, and the regulator should be screwed down until it no longer occurs.

The gas should be adjusted for each barrel of each gun and the setting of the regulator for best operation should be carefully recorded.

#### EXAMINATION OF THE GUN BEFORE FIRING.

Most causes of trouble can be detected if the gun is examined in the following manner before going on the range:

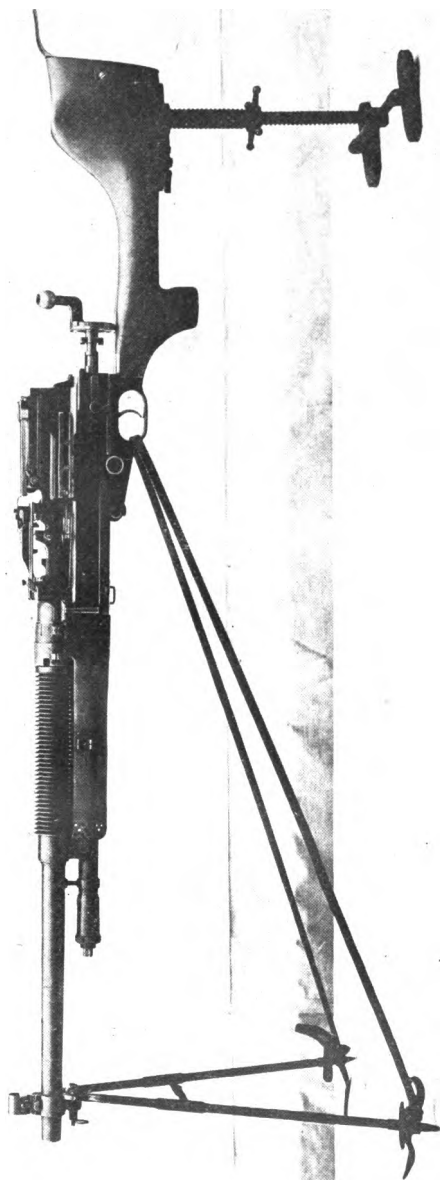
Cock the gun and let the mechanism down slowly by hand, observing the fermeture nut to see whether the mechanism locks entirely. The mechanism should go down slowly and smoothly without showing a tendency to stick or bind at any point. If the mechanism sticks the cause of the trouble should be located and removed. This is illustrated in the accompanying photograph, Plate VIII. The mechanism of the gun has been let slowly down and has stopped with the cocking handle some distance from the closed position. This is caused by dirt, lack of oil, or friction from some cause.

Dismount the gun, clean all the parts, examine all parts for burrs, if burrs are found remove them with a fine file. Burrs on the actuator, breechblock or other hardened surfaces are best removed by pounding them down *lightly* with a machinist's hammer and afterwards smoothing over the surface with a file. This is to prevent removing the hardened surface and exposing the soft metal underneath. Plate IX shows points on the actuator where burrs are to be expected.

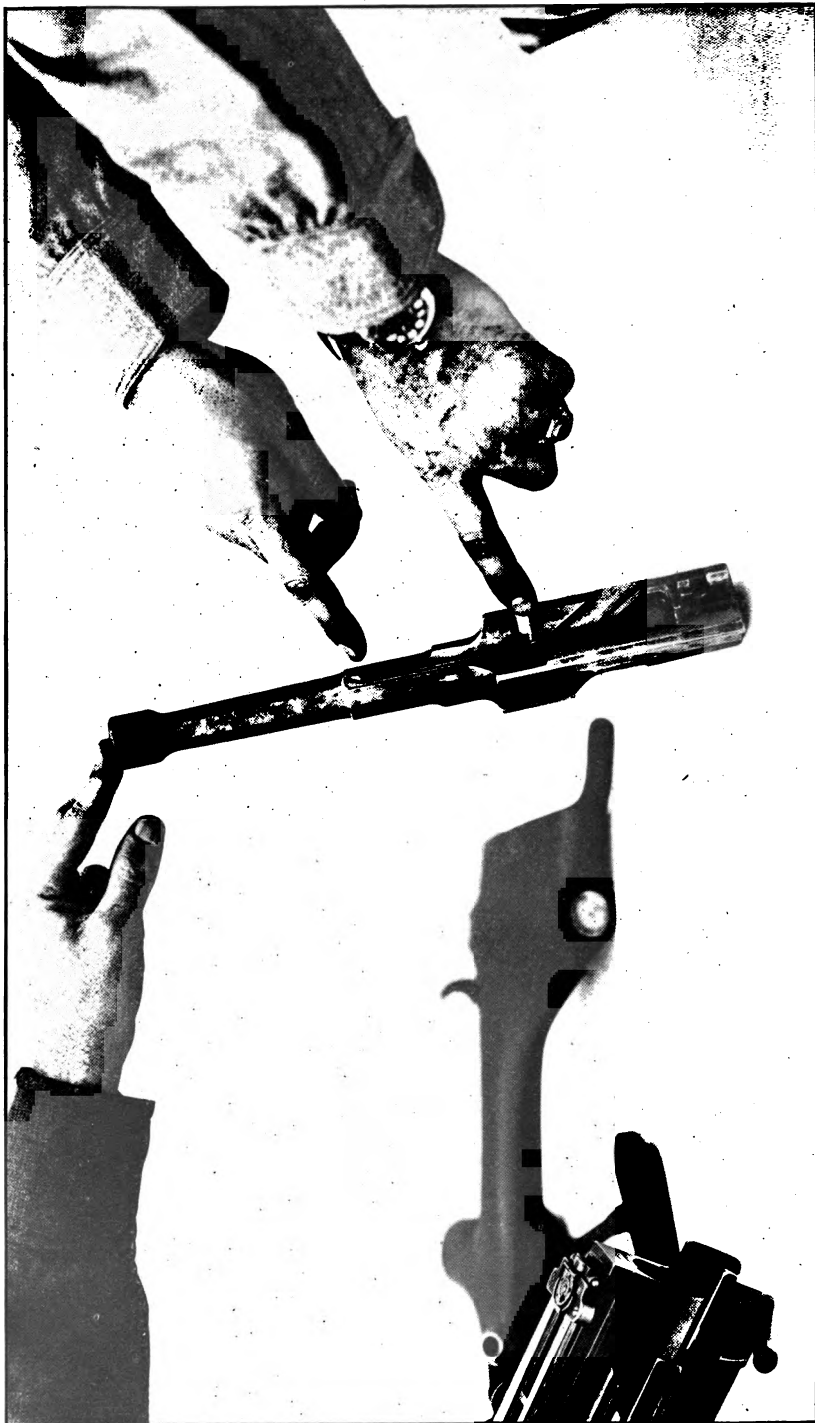
Be sure that the fermeture nuts are free from dirt or chips of brass.

Assemble the barrel to the receiver, making sure that the locking nut is tight; lay the barrel flat on a table or bench and let one man hold firmly while another man tries to detect looseness between the barrel and receiver. If looseness at this point can be detected, it can generally be corrected by using a new locking nut. If this does not correct the fault, try a new barrel. If a new barrel and new locking nut do not correct the fault, the receiver has probably been strained and the gun should be turned in to an arsenal for repair. The method of testing the joint between the barrel and the receiver is shown in plate X.

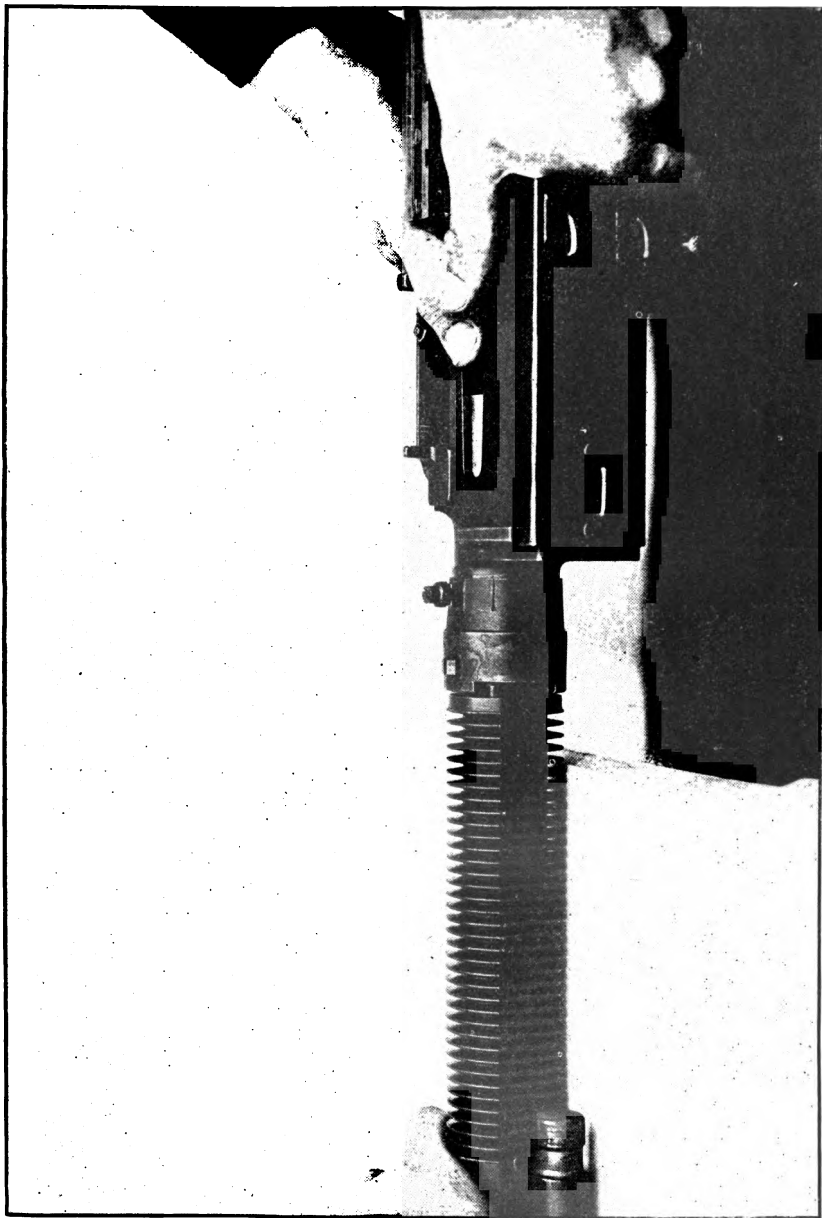




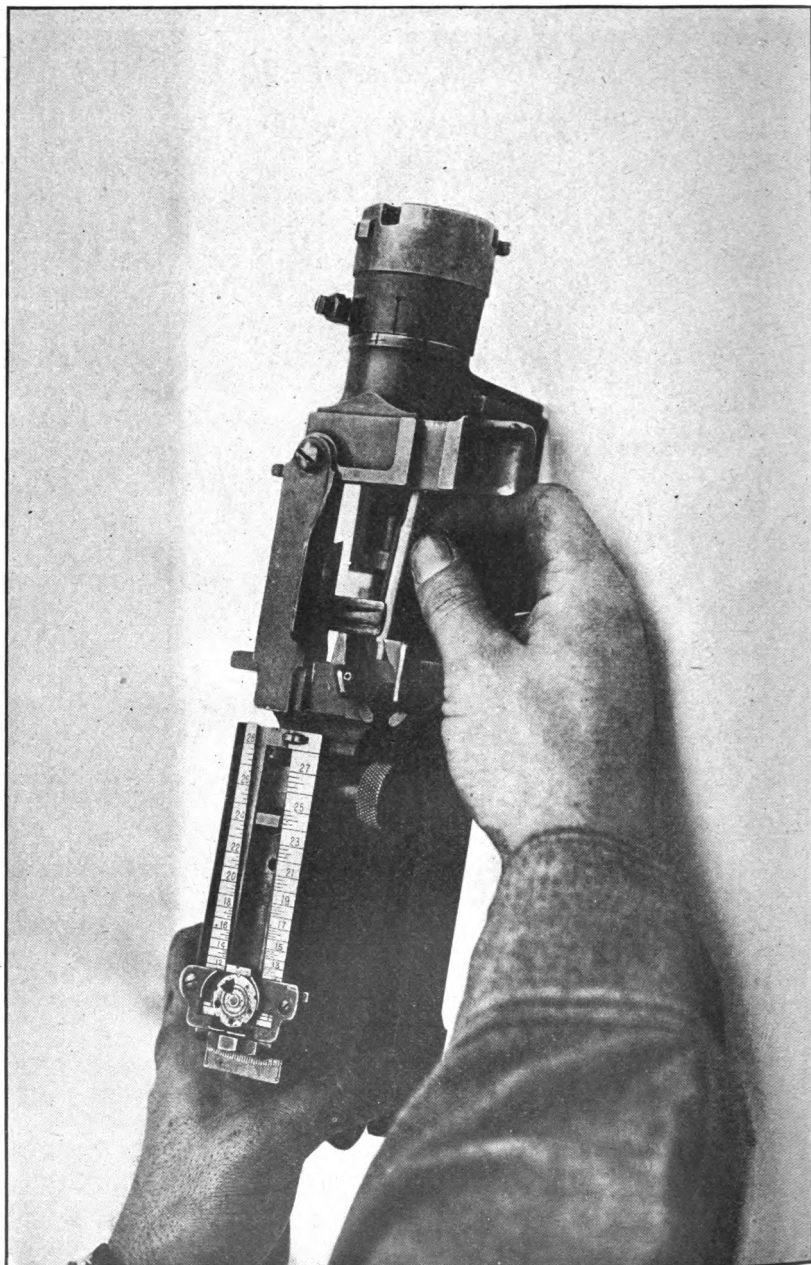
Failure of the mechanism to close completely, owing to undue friction in the parts.



Showing where burrs are likely to be found on the actuator.



Testing to see if locking nut holds barrel tightly to the receiver.



Testing position of tongue.

Be sure that the cartridge stop is screwed in tight and has no tendency to unscrew. If cartridge stop holder has a tendency to unscrew, tighten it by spreading the split part of the cartridge stop holder with a screwdriver.

Be sure that the ejector cap is assembled properly. If the lugs on the cap are not placed in the recesses cut for them in the ejector bushing, the vibration of firing may cause the cap to spring out and stop the gun.

Test the firing pin to ensure that it projects far enough to fire the cartridge by placing it in the breechblock.

Test the tongue of the receiver by entering a cartridge underneath it. The tongue should just allow a cartridge to pass under it with a slight amount of clearance. It should not be bent either up or down, and it should be straight—that is to say, it should not be bent in the middle. If the stripping finger is bent up in the middle it will allow the breechblock to underrun the cartridge and stop the feeding. The method of testing the tongue is shown in plate XI. Any defect should be corrected by bending the tongue carefully either up or down as the case may require. In bending the tongue down a bronze drift should be used and the force should be applied well back on the part of the tongue near the cartridge stop and not near the end. In correcting a defect of the tongue great care should be used to avoid breakage since if this part is broken the receiver can not be repaired except at an arsenal.

Examine bottom plate of the receiver to see whether or not a hump has been raised in the thin part between the lugs. If so, the hump must be removed, as it will interfere with the actuator.

Test the breechblock by placing a cartridge against the front of the breechblock so that it is held by the extractor. In this position the extractor should hold the cartridge tight enough to prevent it from dropping when block is shaken slightly. If it does not hold it the defect may be due to a worn extractor, weak or broken extractor spring, or worn breechblock. The defects should be remedied by supplying such new parts as may be necessary. This test is shown in Plate XII. The breechblock is being shaken and the cartridge is in the act of falling, showing that there is a defect either in the extractor, the extractor spring, or the breechblock.

Test trigger mechanism as follows:

Place the trigger mechanism in guard. Assemble cocking handle in guard. Turn the cocking handle disk to "R." Press cocking handle disk forward with both thumbs and pull trigger. This should draw back the sear arm and then release it. If it will not release the sear arm, the trigger arm has been bent down and the defect must be remedied by bending the trigger arm up slightly. Turn the cocking handle to "A" and repeat the test. The sear

should be drawn back and held back. If the cocking handle releases the sear at "A" the trigger arm has been bent up and must be corrected by bending down slightly. Never attempt to correct a defect of the trigger arm by filing, as this will only make matters worse. The test of the trigger mechanism is shown in Plate XIII. The cocking handle is set at "R" and the trigger arm has just released the sear. If the cocking handle disk is now held firmly in the position shown and the sear knob is turned backward the hook on the sear arm should just barely clear the hook on the trigger arm. If it clears by more than about the thickness of a sheet of paper the trigger arm is too far up.

Assemble gun with hand guard off and with gun supported on barrel rest and elevating mechanism. Cock the gun and let the mechanism down slowly to see that the actuator does not strike on the gas nozzle. If actuator strikes on gas nozzle it may be due to a bent actuator or to a loose locking nut. This test is shown in Plate XIV. It will be observed that the actuator is striking on top of the gas nozzle. In this case this is due to a loose locking nut. Shooting the gun in this condition would batter the cup of the actuator in such a manner as to enlarge it and necessitate more gas in order to make the parts function and a point would soon be reached where the gun would not operate with zero gas setting. The remedy is ordinarily to use a tight locking nut. If this fails the actuator is probably bent and should be replaced.

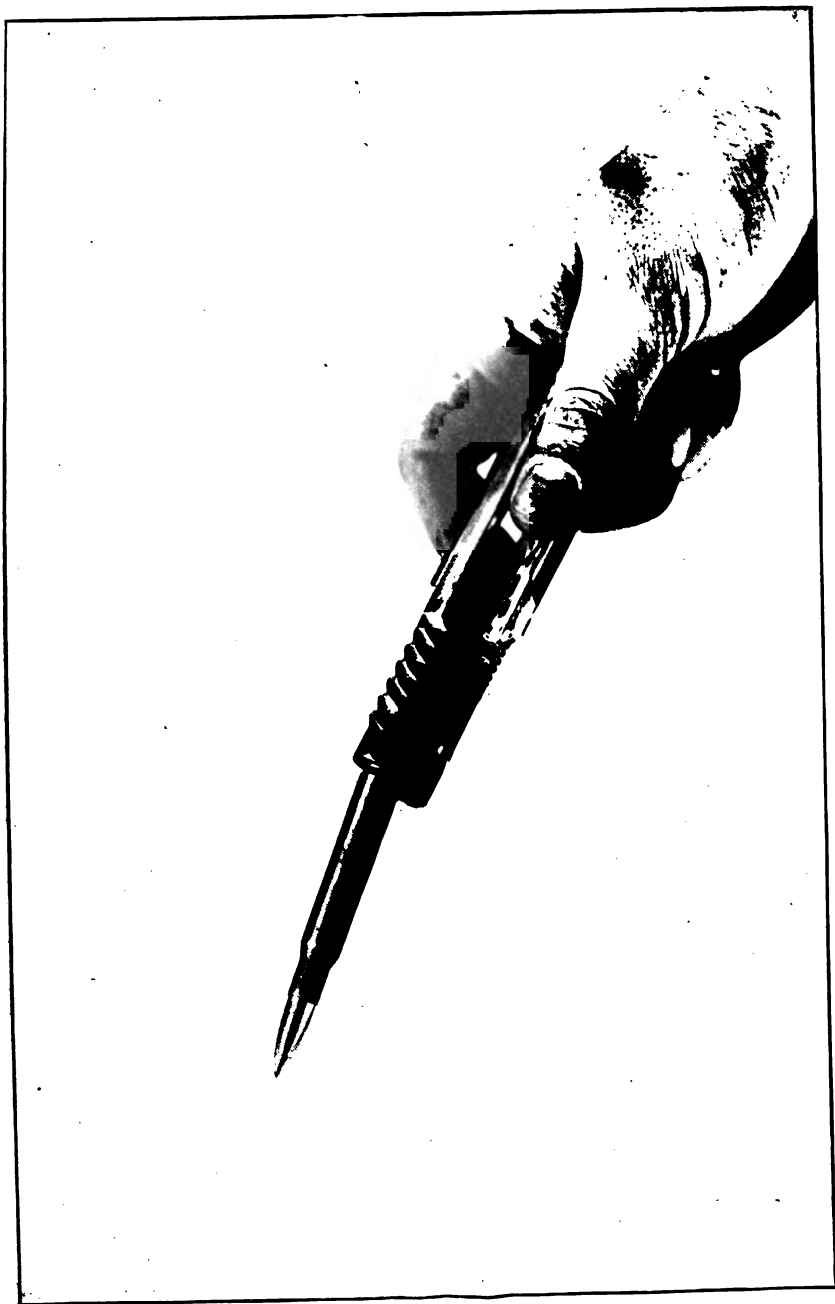
Assemble the gun properly. Take out gas regulator, oil the threads, replace gas regulator and set it to the reading for best operation.

See that the feed strips are properly sized. Improperly sized feed strips will drop cartridges into the ferreture nut and the breech-block will not close entirely owing to the fact that the cartridge does not feed properly into the barrel. The brass at the front end of the cartridge may be stripped back due to its striking on the edge of the barrel. The proper sizing of the feed strips is best determined in a practical way by setting the resizing tool so that space between the roller support and the body will just admit a piece of metal the thickness of a cent. The method of testing the adjustment of the resizing tool is shown in Plate XV.

The strips should be resized each time they are reloaded.

#### GENERAL HINTS.

Avoid shooting the gun with a loose locking nut. A very loose locking nut will cause shells to rupture, but even if the locking nut is not so loose as this, it should not be used if any appreciable looseness can be detected, because the pounding effect due to the looseness

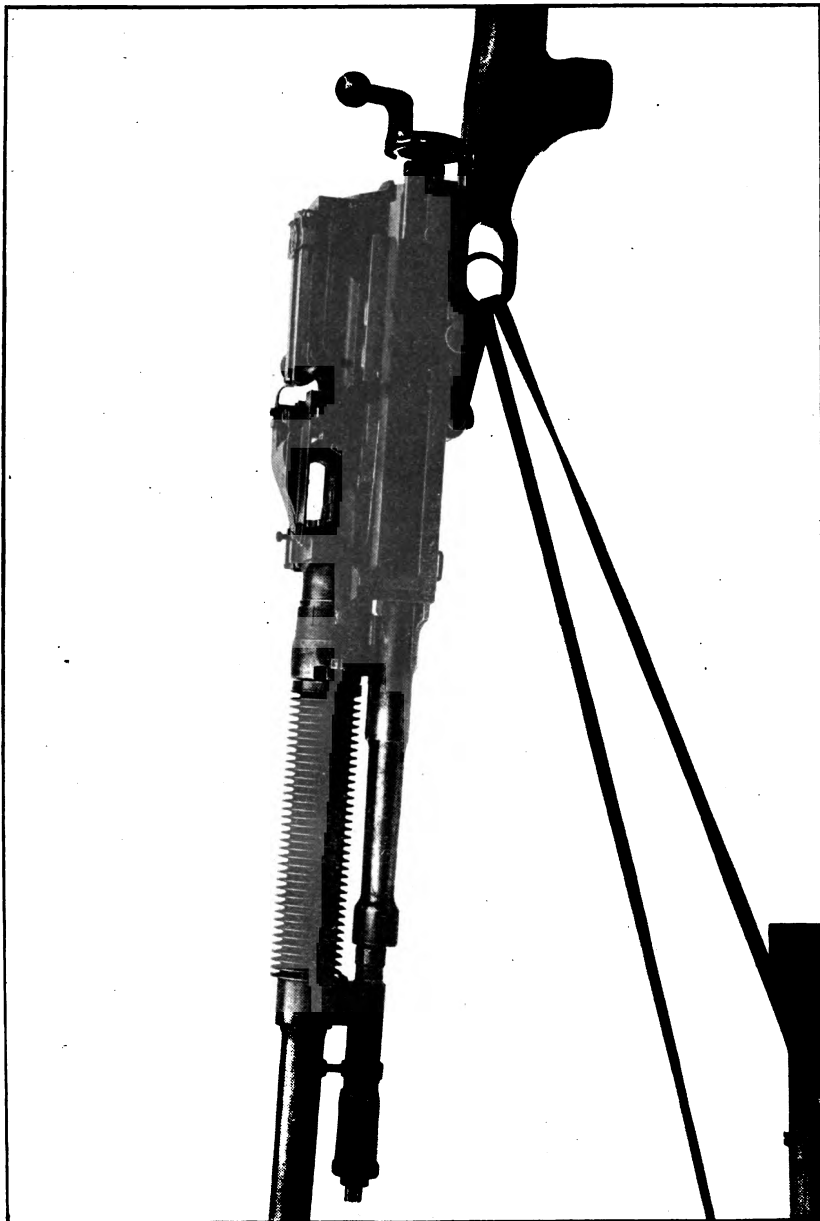


Testing breech-block and extractor.



Testing the trigger mechanism.





Actuator striking gas nozzle on account of loose locking nut.



Testing the setting of the resizing tool.

between the head of the cartridge and the breech block will soon rack every part of the gun. Guns have been seen in which the barrel, the fermeture nut, the breechblock, and the receiver have all been so strained as to render them unserviceable through the use of a loose locking nut. In addition to this a loose locking nut is frequently the cause of broken fermeture nuts, owing to the fact that the shock of the excessive pounding is received directly upon the threads of the fermeture nut. A loose locking nut will also cause the cup of the actuator to strike the gas nozzle and in this way the cup of the actuator and the gas nozzle will become so worn that the gas will escape and fail to blow the actuator entirely back and the gun will fail to function even with zero gas setting.

Avoid racing the gun by shooting it with a low gas setting, as the excessive vibration will rack parts of the mechanism. Avoid getting oil on the barrel. If oil is placed on the barrel it will burn when the gun gets hot, causing smoke which will disclose the position of the gun.

Be sure that the handguard is not bent so that it will strike the actuator and interfere with the operation. In case the handguard is bent remember that the gun can be used without a handguard. Keep the rear sight fixed base screw tight. If it shows any tendency to unscrew burr down some metal on the edge of the screw. The stock bolt and guard screw should be tightened periodically.

Utmost care should be taken to avoid getting old parts into the spare parts case or the gunner's pouch. If a part has become unserviceable it should at once be thrown away if an expendable part, and if a part to be surveyed it should be marked by a file mark or by tying a string on it so that it will not be used again and thus cause malfunctioning at a critical time.

In setting up the check nut do not use any more force than is necessary, as it is very easy to twist off the locking nut screw by setting up the check nut too tightly.

#### JAMS, MALFUNCTIONS, AND STOPPAGES.

The most important causes of malfunctions in this gun are: Wrong gas adjustment, loose locking nut, improperly sized feed strips.

Fortunately all these causes are avoidable and consequently with a well-instructed gun squad malfunctions are of comparatively rare occurrence.

While the causes mentioned above are responsible for most of the stoppages, there are many other things which may cause trouble, some of the most important of which are mentioned in the following pages.

## IMPROPER MANIPULATION.

With a well-instructed gun squad none of these malfunctions will occur.

(a) Wrong gas adjustment—not enough gas.

This will cause the gun to stop with the breechblock partly shut with an empty cartridge in front of the breechblock. Or it may blow the actuator back just far enough to eject the empty cartridge and load the new one without causing the actuator to catch on the sear. This will cause the gun to fire automatically with the regulator set at “R.”

(b) Wrong gas adjustment—too much gas.

This will cause the gun to race and is very bad for the mechanism; it may cause the gun to malfunction in any one of three ways, which are as follows:

The very quick rearward motion of the breechblock may cause the extractor to tear the rim off the cartridge and thus cause a failure to extract.

The cartridge may be extracted with such force that it will strike against the ejector hard enough for the ejector to cut through the head of the cartridge and thus cause a failure to eject.

The feed strip may be fed into the gun so fast that the very quick downward impulse given to the cartridge by the stripping finger may be sufficient to cause it to fall from the feed strip into the receiver before the empty shell has been ejected.

(c) Feed strip improperly entered in loading.

If the front edge of the feed strip is entered under the front feed guide it will be fed down into the fermeture nut and the gun will stop after one shot with the breechblock half open and with an empty cartridge in front of it. The gun can not be cocked until the feed piece is lifted up. To reduce this jam, lift the feed piece to its highest point, cock the gun, and remove the feed strip.

(d) Feed strip too loosely sized.

(e) Dirt or grease in the chamber or dirt or grease on the cartridge.

This will cushion the mechanism in closing so that the cartridge will not fire and the gun will give symptoms of misfire. The barrel and chamber should be carefully wiped out before firing and the cartridges should be kept perfectly dry. Oil on the cartridges will cause dust to stick to them and will cause the same trouble as dirt in the chamber.

(g) Dirt or chips of brass in fermeture nut.

This may prevent the mechanism from locking completely. If the edge of the chamber at the top has a sharp edge where the cartridge enters it may shave pieces of brass off the entering cartridges. These

brass chips may clog the fermeture nut and thus stop the action of the gun. The remedy is to dull the sharp edge with a half-round file or scraper.

(h) Ejector cap improperly assembled.

If the lugs on the ejector cap are not properly engaged in the recesses for them in the ejector bushing, the vibration of firing may cause the ejector cap to spring out against the feed piece and stop the action of the gun.

(i) Hand guard improperly assembled.

If the front end of the hand guard is placed under the lug for it on the rear end of the gas-nozzle ring, the actuator can not go all the way forward and the cartridge can not be fired. When the trigger is pulled the mechanism will go down but the piece will not fire, as the cartridge can not be struck by the firing pin.

#### TROUBLES CAUSED BY FIRING THE GUN WITH LOOSE LOCKING NUT.

(a) Excessive head space, due to the fact that the locking nut does not hold the barrel tightly against the receiver.

(b) This causes ruptured shells, for when the explosion takes place the thin part of the cartridge at the front end is expanded against the chamber by the pressure of the powder, and if the space between the head of the cartridge case and the face of the breechblock (head space) is excessive the rear end of the cartridge, being unsupported, is torn off by the pressure and the front end of the separated case is left in the chamber. The next cartridge can not fully enter the chamber on account of the presence of the separated case and a stoppage results. When this occurs the gun should be cocked, the live cartridge which is pushed part of the way into the chamber should be removed, the feed strip should be taken out, and the separated case should be removed. The locking-nut screw and check nut should then be loosened, the locking nut should be tightened as much as possible, the screw and check nut set up, and firing resumed. If separated cases recur, use a new locking nut. If this does not correct the difficulty use a new barrel, and if this is not effective use a new breechblock. If the trouble still persists use a new fermeture nut. If none of these remedies overcome the difficulty the neck of the receiver has probably been stretched and the gun should be turned in to an arsenal for repair.

Shooting the gun with excessive head space will rapidly strain the threads on the breechblock, the threads on the fermeture nut, the threads on the receiver, and the threads on the locking nut on account of the fact that the loose play between the head of the cartridge and the face of the breechblock causes a severe pounding effect when the gun is fired. Shooting the gun in this condition will also

frequently break the fermeture nut, as the shock of the excessive pounding thus produced is received directly on the threads of the fermeture nut and breechblock.

#### TO REMOVE A RUPTURED CARTRIDGE CASE FROM THE CHAMBER.

A tool is provided for this purpose, called the defective cartridge extractor. This tool is shown in Plate XVI and is used as follows:

1. Cock the gun, remove the feed strip and the live cartridge which is jammed into the chamber.

2. Take the defective cartridge extractor with the spindle driven back and the handle turned to the rear, as shown in "A" in the plate, and insert it through the ejection opening into the chamber of the gun.

3. Holding the handle of the defective-cartridge extractor back parallel to the receiver, lift up the feed piece, and pull the trigger, allowing the breechblock to go forward and strike on the spindle of the defective-cartridge extractor.

4. Cock the gun.

5. Swing the handle of defective-cartridge extractor around toward the muzzle of the gun. The bent part of the handle will act as a fulcrum against the forward part of ejection slot and will draw out the body of the instrument with the defective cartridge firmly wedged on, as shown at "B" in the plate.

#### DEFORMED OR WORN PARTS.

##### (a) Bent hand guard.

If the front stiffening piece of the hand guard gets bent down, it will go under the shelf made for it on the gas nozzle-ring and will, consequently, interfere with the movement of the actuator, preventing it from going all the way forward. A little care used in assembling the gun will prevent this occurrence, but if the hand guard does become bent at this point, or in cases of necessity, it can be left off and the gun operated without it.

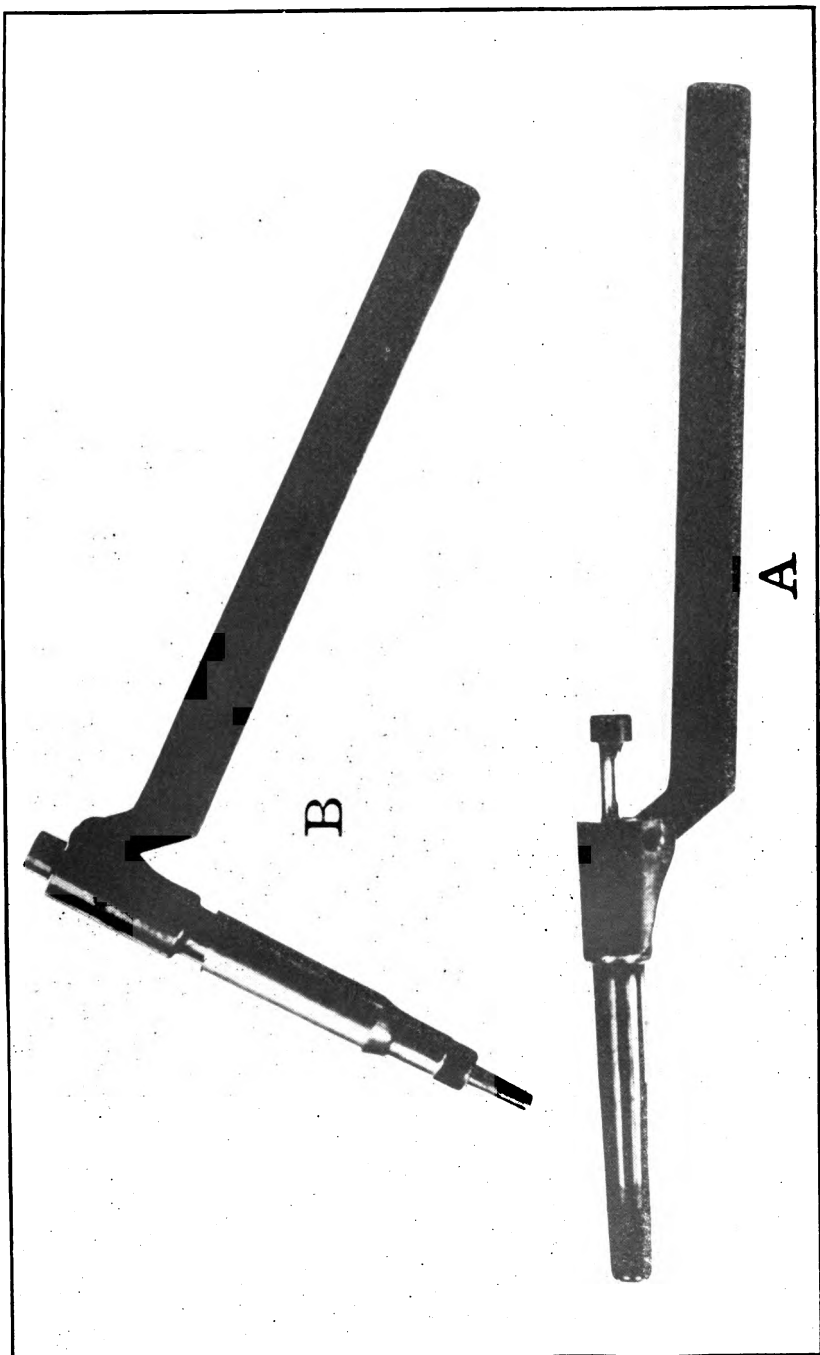
##### (b) Worn breechblock.

If the lips at the front edge of the breechblock on each side of the ejection slot are worn, the breechblock will not hold shells firmly, and the cartridge may be only partially extracted and then dropped in the receiver and the live cartridge will be fed down on top of it.

The same difficulty will be caused by a worn extractor or weak extractor spring. This defect can be detected by testing the breechblock as already described.

##### (c) Worn firing pin.

Sometimes the point of the firing pin wears or breaks off in such a manner that the fracture can not be detected by the eye. This will







cause misfires. This defect can always be detected by testing the firing pin in the breechblock as already described.

(d) Stripping finger bent up.

The tongue of the receiver (sometimes called the stripping finger) may become bent up in the middle so that the breechblock underruns the cartridge and thus fails to feed. This can be remedied by bending the tongue down as already described, taking care to apply the force well back near the middle of the tongue and not near the end.

(e) Bent feed-piece spring.

The feed-piece spring may be bent so that it rubs against the cover plate or does not properly engage in the notches in the feed strip. This can easily be determined by drawing an empty feed strip through the gun and noting where the feed-piece spring engages. Any defect may be corrected by bending the spring with a pair of pliers. A notch may become worn in the pawl of the feed-piece spring. If this occurs, remove it with a file.

(f) Stopped orifice.

This defect is comparatively rare. In most cases where a stopped orifice is suspected it will be found that the use of a loose locking nut has allowed the actuator to strike the gas nozzle, thus battering it out and requiring the use of more gas. By occasionally shooting two or three shots with the gas regulator removed the tendency of the orifice to become stopped up may be overcome.

#### BREAKAGES.

Occasionally breakages will occur and the best method of overcoming the jams or malfunctions which may be caused in this way is for the gun crew to have a thorough knowledge of the mechanism of the gun and the functions of each part.

One of the most serious jams to which this gun is subject is caused by the breaking of one of the lugs on the firing pin. In this case the gun can not be cocked. In order to reduce this jam proceed as follows:

Lift up the feed piece.

Remove the feed strip.

Let one man hold the cocking handle back while another taps the breechblock forward by means of a screw driver placed in the notch on the left side of the breechblock.

Remove the cocking handle, guard, and actuator spring. Hook the cocking handle in the actuator and draw it gently to the rear, at the same time pushing back the top lug of the firing pin with the extractor dismounting tool. This will usually free the jammed parts and allow their removal.

## DEFECTIVE AMMUNITION.

Malfunctions may be caused by using reloaded ammunition or ammunition of old manufacture. Never use reloaded ammunition in machine guns, and always use ammunition of the latest manufacture obtainable. Reloaded ammunition is marked on the box "0" or "00." Ammunition manufactured prior to 1909 should not be used.

## POINTS TO BE OBSERVED BEFORE GOING ON THE FIRING LINE.

(a) Examine mechanism to verify readiness for action, as described above. Correct any defects discovered.

(b) See that binder is properly adjusted.

(c) See that working parts are well oiled, and that no oil is allowed to get on the outside of barrel.

(d) See that bore and chamber are free from dirt or foreign substances.

(e) Set gas regulator to proper reading.

(f) See that latigo straps for barrel rest are properly adjusted.

(g) See that spare barrel is in good condition, bore clear, and gas regulator properly set.

(h) See that telescopic sights are clean and properly adjusted.

(i) See that oil cans are full.

(j) See that contents of gunner's pouch and spare parts case are in good condition.

(k) See that no worn or deformed parts are allowed to get into gunner's pouch or spare parts case.

(l) Be sure that feed strips are properly sized.

(m) See that ammunition is clean and free from grease or dirt.

(n) Have cooling sponges in good condition and ready for use.

## POINTS TO BE ATTENDED TO DURING FIRING.

(a) Lay the gunner's pouch on the ground near the gun. If it is worn on the body it will be forgotten and left with the gunner if he should become a casualty.

(b) During a cessation of fire replace a partly used feed strip with a full one, and cool the gun or change the barrel if time permits.

(c) Embrace every opportunity to oil the working parts of the gun.

(d) Replenish the supply of ammunition on the firing line at every opportunity.

(e) During a temporary cessation of firing, reset the barrel rest legs if necessary.

(f) When barrel gets very hot, cool it with cooling sponge or change barrel.

(g) Watch the ejection to see if gas setting is all right. When ejection becomes weak, screw down the regulator several turns. This becomes necessary after a few minutes' firing, owing to the increase of friction which occurs when the oil burns off or becomes mixed with dust.

(h) If sand is blowing, cover up the receiver when the gun is not firing.

(i) If telescopic sight is being used, verify the setting from time to time, as the vibration of firing frequently causes the windage setting to change.

#### POINTS TO BE ATTENDED TO AFTER FIRING.

(a) Before leaving the firing point, remove the feed strip and snap the mechanism on an empty chamber to be sure the gun is unloaded.

(b) Clean and oil the bore of the gun immediately after firing and once a day thereafter for 10 days.

(c) When time permits, dismount the gun, clean and oil all parts, correct any defects that may have been discovered during the firing, and reassemble.

(d) Tighten stock bolt and guard screw.

(e) Resize and reload all feed strips.

#### CLEANING AND CARE OF THE RIFLE.

In order that the rifle may work smoothly, it is necessary that it be thoroughly cleaned and oiled after firing. All traces of fouling from the powder gases should be removed from those parts exposed to them. This is especially true of an automatic rifle of this type. The actuator and regulator piston should be removed immediately and thoroughly cleaned and oiled. Warm water, with bicarbonate of soda in solution, will aid considerably in removing the fouling. The small pieces of brass due to the shearing of the cartridge cases on the clips of the feed strip should be carefully removed from the mechanism.

It has been found that a deposit of metallic fouling is left in the bore of the rifle when ball cartridges, caliber .30, model of 1906, or of earlier manufacture, are used, and a solution for the removal of metallic fouling has therefore been issued by the Ordnance Department to all post ordnance officers for reissue to organizations in accordance with the following table of annual allowances:

For a machine-gun company or troop:	Ounces.
Ammonium persulphate .....	30
Ammonium carbonate .....	30
Ammonia, 28 per centum .....	120

One ounce of ammonium persulphate, 200 grains ammonium carbonate, 6 ounces ammonia (28 per cent), and 4 ounces water will make a sufficient quantity to clean 20 rifles. If no scales are available for weighing the ingredients, they may be measured, and the equivalents are as follows:

- 1 ounce of ammonium persulphate equals two medium heaping spoonfuls.
- 200 grains ammonium carbonate equals one medium heaping spoonful.
- 6 ounces ammonia, 28 per cent pure, equals three-eighths of a pint.
- 4 ounces water equals one-fourth of a pint.

The spoon referred to above is the spoon issued by the Ordnance Department for the mess outfit.

The solution is made as follows:

The carbonate and persulphate should first be pulverized and mixed together and the ammonia and water added, after which the mixture should be thoroughly stirred. The solution should stand for half an hour before using. The bore of the rifle should be plugged with a cork or wooden plug at the breech end and just below the metallic fouling. The bore should then be filled with the solution and the muzzle corked or plugged. The solution should remain in the bore for about two hours, or long enough to cut the metallic fouling, after which it should be removed and cotton flannel or other soft material run back and forth through the bore to remove the residue. Great care must be taken to remove the solution from all metallic parts, as it may start rusting in a very short time. Special care should be used in removing it from the breech mechanism. The solution may be used several times, but after it has been once used it should be placed in a bottle and not mixed with any unused solution. This solvent is expensive and should be used economically.

The nozzle and gas chamber of the gas-nozzle ring should be closed with wooden plugs before the solution is poured into the bore.

The solvent should be prevented from entering the orifice by keeping this point uppermost during the process. In some cases it has been found advisable to remove the orifice screws and plug the orifice completely before pouring in the solvent.

If the rifle is not to be used for some time, it should be thoroughly cleaned and all the moving parts given a thin coat of cosmic. This can be best accomplished by warming the latter and applying with the grease brush. Before attempting to fire the rifle, *all this cosmic should be removed*, especially around the ferreture nut, otherwise the rifle will not function properly. *The moving parts of the mechanism should then be lightly oiled before using.*

Whenever it is noted that the regulator can not be rotated by hand, it should be removed by the dismounting wrench and the gas chamber cleaned of fouling by the gas-cylinder cleaner, which is furnished with the accessories.

180



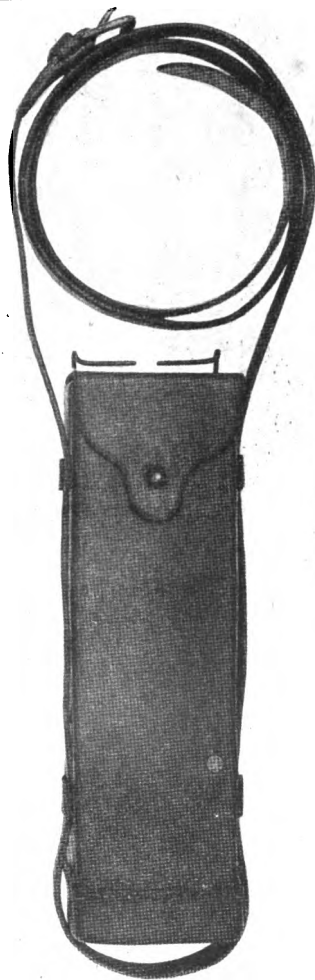
181



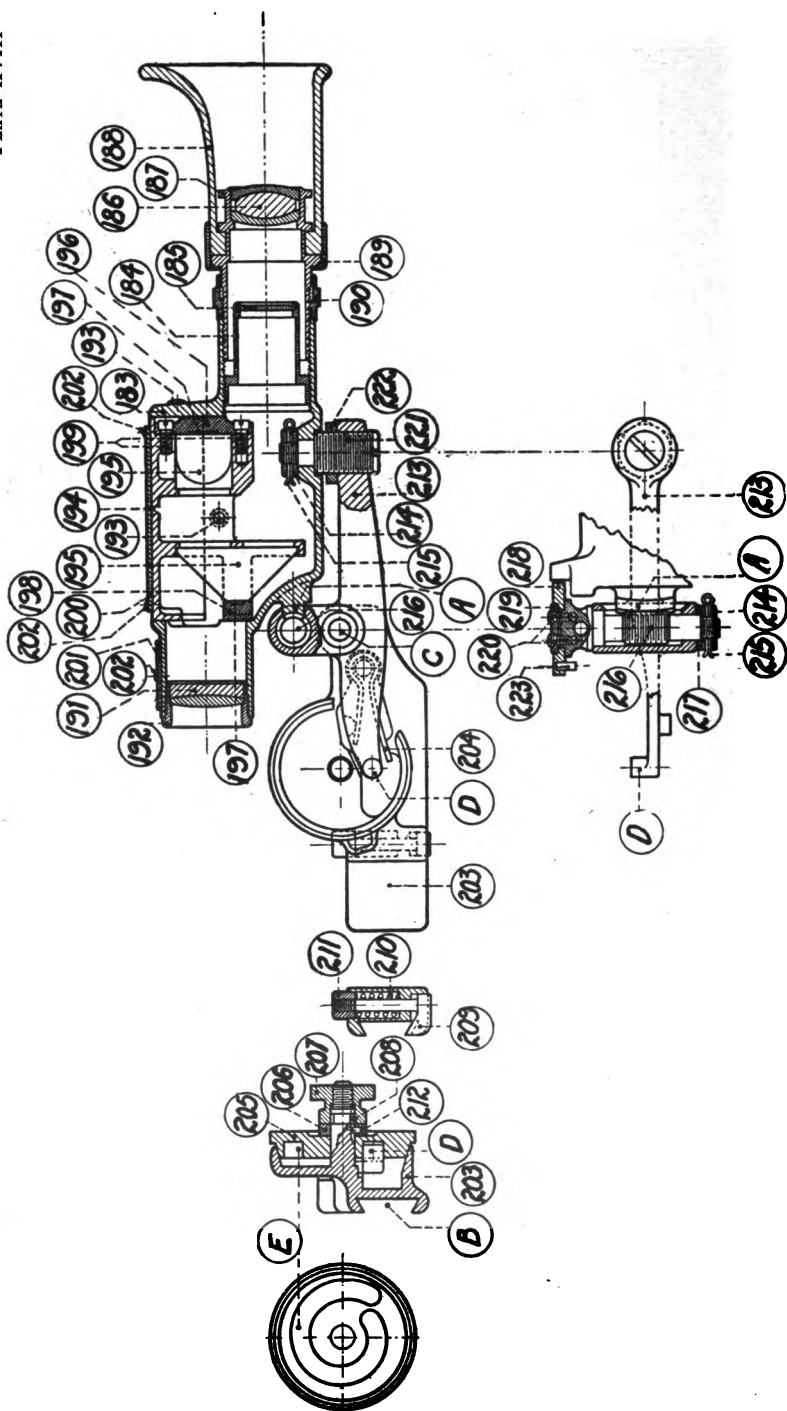
182



TELESCOPIC SIGHT MODEL OF 1908



TELESCOPIC SIGHT POUCH



The firing pin, the breechblock, and the actuator are casehardened, and under no conditions should be touched by a file. After a series of firings the front of the upper lug of the firing pin may appear battered, due to that force which is required to carry the claw of the extractor over the head of the cartridge case, which is exerted wholly on this shoulder. Should this shoulder become battered sufficient to cause the firing pin to bind in the breechblock, the former should be removed and a new firing pin inserted. To file the firing pin would make matters worse by exposing the soft steel beneath and increase the trouble.

A jointed cleaning rod with six cleaning brushes is furnished with each rifle.

Sperm oil only shall be used for lubricating metallic bearings and contact surfaces.

#### DESCRIPTION OF THE TELESCOPIC SIGHT, MODEL OF 1908.

[Plates XVII and XVIII.]

##### Nomenclature.

[Numbers before components refer to numbers on Plates XVII and XVIII. Property classification: Class VII, section 1.]

180. Sight-bracket screws.	} Parts of gun.	202. Table screws.
181. Telescopic sight bracket.		203. Slide.
182. Screw-driver wrench.		204. Lever spring.
183. Body.		205. Range dial.
184. Reticule holder.		206. Range-dial washer.
185. Reticule.		207. Range-dial knob.
186. Triple eyelens.		208. Spring cotter (for knob).
187. Triple eyelens holder.		209. Catch.
188. Eye cap.		210. Catch spring.
189. Eye-cap ferrule.		211. Catch nut.
190. Focusing lock nut.		212. Range-dial-washer pin.
191. Objective.		213. Lever.
192. Objective cell.		214. Spanner nuts.
193. Body screws.		215. Spring cotters (for nuts).
194. Prism holder.		216. Drift screw.
195. Prisms.		217. Drift-screw washer.
196. Prism cap.		218. Drift dial.
197. Prism-cap spring.		219. Drift-dial washer.
198. Prism cap.		220. Drift-dial screws.
199. Prism-cap screws.		221. Adjusting screw.
200. Wind and range table.		222. Adjusting-screw nut.
201. Drift table.		223. Drift-dial pin.

The telescopic sight consists of three essential parts—the telescope, the lever on which the telescope is mounted by a vertical axis, and the slide to which the lever is secured by a horizontal axis. Graduated dials provide means for turning the instrument on both of these axes.

The telescope: In the telescope body is mounted the objective cell for the objective, which has a clear aperture of thirteen-sixteenths inch, a focal length of 7 inches, and gives, with the eyepiece, a power of six diameters and a field of  $4\frac{1}{2}^{\circ}$ . The telescope is provided with Porro erecting prisms, mounted in accurately milled recesses in the prism holder and held in place under constant pressure by the prism-cap springs of the prism caps, the caps being secured by the prism-cap screws. The telescope has a reticule holder, into which is spun the glass reticule, on which are etched vertical and horizontal cross lines and a stadia line, the latter being so placed that it spans the height (5 feet 8 inches) of an average man standing at a distance of 1,000 yards. The latest telescopic sights have three stadia lines for ranges of 1,000, 1,500, and 2,000 yards, respectively. The telescope has an eyelens holder for the Steinheil triple achromatic eyelens. The holder has a long threaded portion which screws into the body, and by which means for focusing is secured. The eyelens holder is locked in position by the focusing lock nut and is provided with an eye cap of soft rubber, fastened by the eye-cap ferrule. On each telescope is fastened, by means of table screws, the wind and range table and drift table, and on the rear face of the latest telescopes is fastened a range plate which shows the ranges corresponding to the three stadia lines.

The lever supports the telescope body by means of the adjusting screw. This screw forms a vertical axis for the telescope, and the segmental worm gear, together with the drift screw and its graduated drift dial, provide means for turning the telescope on this axis for drift and wind corrections.

The slide supports the lever on the horizontal axis. The pin of the lever engages with the internal hardened-steel cam of the range dial, and is kept in contact with it by the lever spring. The inner circumference of the range dial is conical and fits in a conical bearing, so that it can be clamped in any desired position by tightening the range-dial knob against the keyed range-dial washer. By turning the dial the telescope is rotated on the horizontal axis, giving the proper depression angle for range correction.

The telescopic sight bracket is assembled to the receiver of the rifle by means of screws. The sight is mounted on the bracket by means of the dovetail in the slide and is held in position by means of the catch which engages the notch in the bracket. The catch can be released by pressing the knob.

#### ADJUSTMENT AND CARE OF THE TELESCOPIC SIGHT.

*For focus.*—In adjusting the instrument at the factory the reticule is set exactly in the focal plane of the objective, which has a universal focus beyond 100 feet, and the eyepiece is set for the vision of an



average observer. Should alteration of the focus of the eyepiece be necessary to suit special conditions, unscrew the focusing lock nut and screw the eyepiece out or in until the cross lines of the reticule are sharply defined, and at the same time the image of the target is clearly visible. Then move the head up and down, so that the eye may travel across the eyepiece. If the focus has been correctly found there will be no parallax—that is, no apparent motion of the cross wires with reference to the target when the eye moves across the field. The focus being accurately adjusted, be sure to lock the eyelens holder by tightening the focusing lock nut. The rubber eye cap can now be turned without affecting the focus to any desired position. If the rubber cap does not turn easily, loosen the eye-cap ferrule and tighten it again when the adjustment is made.

*For elevation.*—The range dial is graduated from 0 to 3,000 yards by 20-yard divisions. To make elevation adjustment set the sight of the rifle at 500 yards. Set the range dial of telescopic sight at the same range and clamp it. The cross wires of the telescopic sight and the line of sight of the rifle through the open sight should then bisect the target exactly. If the cross wires of the telescopic sight are too high, unscrew the hexagon adjusting-screw nut, using the wrench provided with the sight, and turn the adjusting screw clockwise, which will cause the cross wires to drop on the target. Turning the adjusting screw in the opposite direction will make the cross wires rise. After the adjustment is made be sure to tighten the nut. The rifle is then fired several shots to test elevation, the necessary correction being made by the movement of the adjusting screw until a satisfactory elevation is obtained.

*For drift.*—The graduations on the drift dial correspond to 1 inch on the target at a range of 100 yards. Turning the dial clockwise corrects to the right, as indicated by the letter R, and counterclockwise to the left, as indicated by the letter L. There are 38 points of left and 46 points of right drift correction. The drift dial should read "0" when the optical axis of the instrument is parallel with the bore of the rifle. Should it be necessary to adjust the dial, make the optical axis of the instrument parallel with the bore of the rifle, loosen the two drift-dial screws, which will permit rotating the dial without moving the drift screw, set the dial exactly at "0," and clamp the screws firmly again.

#### CARE AND PRESERVATION.

Telescopic sights are necessarily delicate instruments and must not be subjected to rough usage, jars, or strains. When not in use the telescopic sight should be kept in its case and stored in a dry place. It should be occasionally examined to insure its not being corroded, and all traces of dust or moisture should be removed before

being put away. To obtain satisfactory vision the glasses should be kept perfectly clean and dry. In case moisture collects on the glasses, place the telescope in a gentle warmth; this is usually sufficient to remove it. A piece of chamois skin or a clean linen handkerchief will answer for cleaning purposes, care being taken that the cleaning material does not contain any dirt or grit. These sights before issue are carefully adjusted and their adjustment proven by actual firings. The prism holder should never be opened except by a competent person. The body of this telescope and its objective must remain intact. The eyepiece can be removed after loosening the focusing lock nut and the eyelens and reticule then cleaned. Before incasing the prisms at the factory the interior of the body is thoroughly cleaned and all particles of dust removed. If any fine particles should be left in the body, or if the body should be opened and particles enter, they will settle upon the reticule and, when magnified by the eyelens, obscure the vision. Four small holes are punched through the rubber eye cap to permit the escape of air on recoil, thereby preventing suction on counter recoil.

**POUCH, MODEL OF 1911, FOR TELESCOPIC SIGHT, MODEL OF 1908.**

The pouch furnished for the telescopic sight is made of russet collar leather. It is provided with a double-hook and a leather strap, so that it can be carried either on the cartridge belt or over the shoulder.

**AMMUNITION.**

The ammunition used in this rifle is the same as that provided for the United States rifle, caliber .30, model of 1903. It is fed into the rifle by means of feed strips, holding 30 cartridges each. The cartridges are located in the feed strips by means of a loading tool.

**FEED STRIP.**

[Plate XIX.]

With each rifle are furnished feed strips made of sheet steel, spring tempered, by means of which the cartridges are fed into the rifle. Each feed strip is designed to hold 30 cartridges.

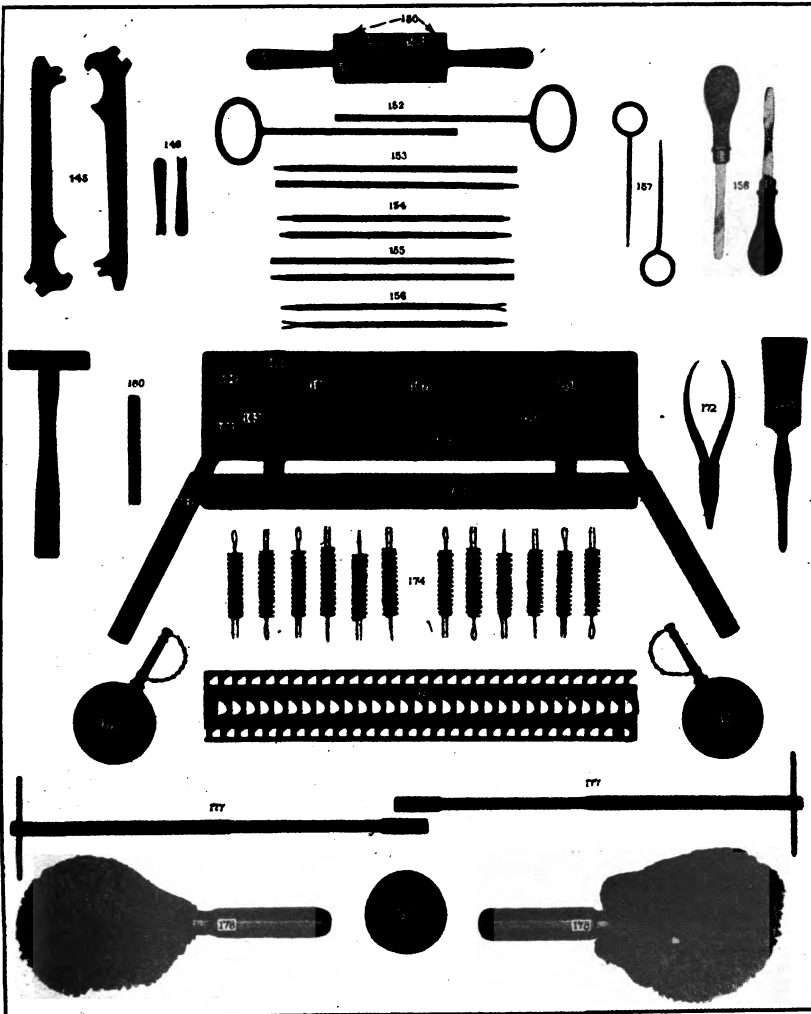
On each strip are punched three rows of large clips; which hold the cartridges longitudinally, and one row of small clips, which align and hold the cartridges transversely. Ten feed strips are packed in each ammunition box.

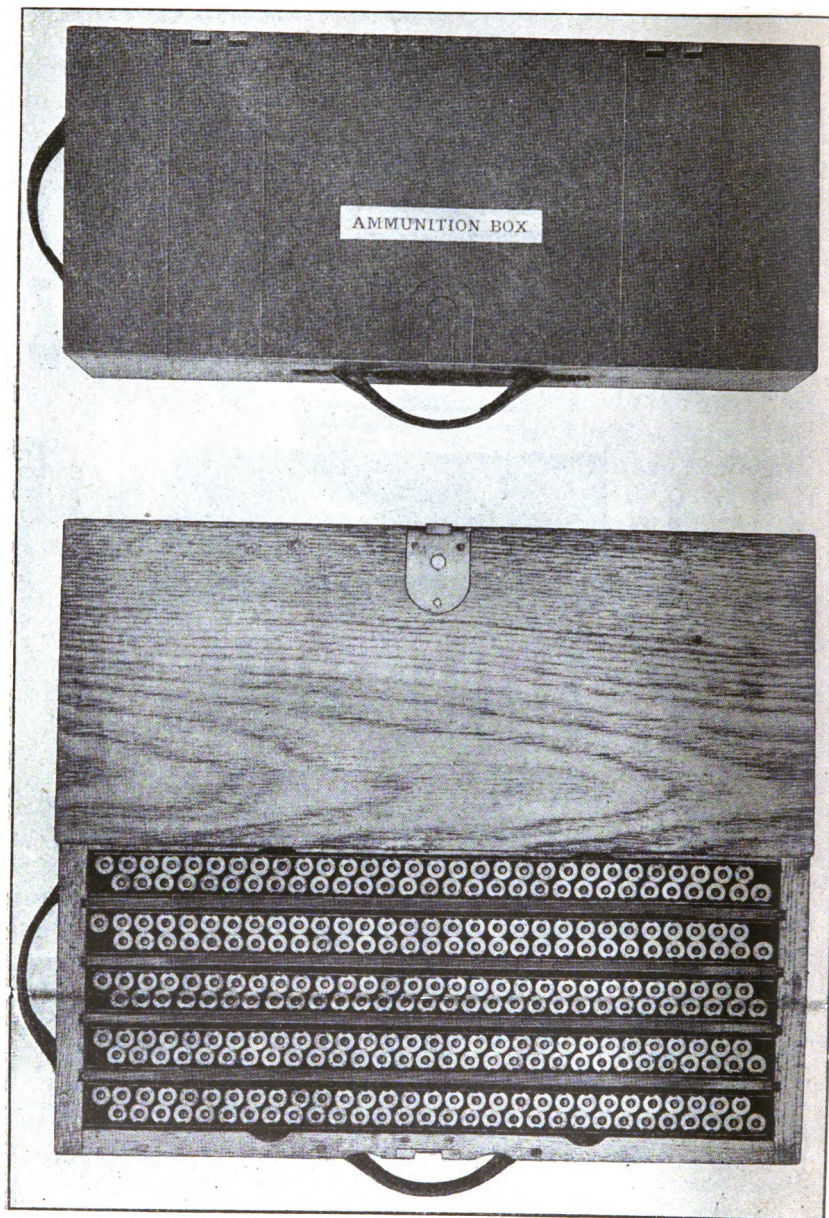
**THE AMMUNITION BOX.**

[Plate XX.]

The ammunition box is designed to hold 10 loaded feed strips (300 cartridges), and is made of seasoned white oak or ash. It is about

PLATE XIX





18 inches long and nearly 8 inches wide, exterior measurement; the ends and sides are dovetailed together, and the bottom is secured to the former by screws. The body contains five longitudinal partitions, in each of which can be placed two feed strips, the feed strips being separated at the bottom by a wooden cleat. The lid is secured to the body by two strap hinges which extend around and are secured by screws to three sides of the box. The lid is held in its closed position by the lid catch. The latter is a brass L-shaped catch secured in a brass-lid catch frame by a pin. The frame is attached to the lid by three rivets and a brass plate. On the interior is a spiral spring which supports one end of the lid catch and keeps the opposite end engaged in the brass-box catch frame screwed to the body. By pressing downward on the lid catch the cover can be released. The interior of the box is given a coat of linseed oil and its exterior is painted olive drab. On the left end of the box and the front side are leather handles secured to the box by steel copper-plated pins. The seats for the handles are recessed so the handles will be flush with the sides of the box.

#### SPARE-BARREL CASE.

The barrel case used for carrying the spare barrel is ordinarily carried on the animal, but may be carried by hand as well. It is lined with sheet brass and has at its bottom a leather block called bottom guide, which serves to hold the barrel in place.

The lid of the case contains another leather guide designed to support the spare barrel in any position it may assume. The hinge on the lid of the case is so located that the barrel may be withdrawn without removing the case from the hanger. The chafing strips are designed to prevent metal parts of the rifle hanger from damaging or wearing the leather.

#### SPARE-PARTS CASE.

The spare-parts case is used for carrying certain spare parts for the rifle. It is made up in the form of a leather cover, a pocket of which carries a wooden block called spare-part case packing block. This block is recessed and carries on the bottom side two spare stocks and cleaning brushes, the latter being held in place by means of the brush slides; on the other side of this block are carried certain spare parts for the rifle. A duck cover is pulled tightly around the block, which is then inserted into the leather cover. The case is designed to be carried as a top load on the pack frame, but may be carried by hand by means of a convenient handle.

## THE LOADING TOOL.

[Plate XIX.]

The strip guide of the loading tool is a large plate on which are two guides into which the feed strip slides. On the bottom of this plate are riveted one long and two short loading-tool feet, and also four pushing-bar guide slides, each secured by four screws. Into these slides are inserted the pushing-bar guides, which are securely riveted to the pushing bar. The function of the latter is to force the cartridges into the feed strip. This pushing bar is actuated by a bent lever which rotates about the lever axis, the latter screwed to the bottom of the strip guide. One end of the lever is slotted and engages the pushing-bar axis on the guides, the other end is threaded and has the handle attached. The handles are made hollow in order to reduce weight.

To use the loading tool, separate the handles to their full extent and insert a feed strip into the guides, with the edge having the small clip toward the handles. The cartridges are then placed in the clips and pushed forward as far as possible by hand. Then grasp the handles, draw inward, and force the heads of the cartridges over the small clip near the edge of the feed strip. Remove the loaded feed strip by sliding the latter from the loading tool. The loading tool can be used to great advantage with a number of men working, one man with the loading tool forcing the cartridges into partially loaded feed strips, while the others are starting the cartridges by hand into the feed strip.

It has been found that the greatest speed in placing cartridges in the feed strip can be obtained by removing one cartridge from each clip, inserting it with the left hand into the strip, and at the same time spreading the remaining four cartridges of the clip with the right hand and thrusting them into the feed strip. The clip can then be removed with the right hand.

In making requisitions for spare parts for the loading tool it should be noted that there are three lengths of screws for assembling the pushing-bar slide guide to the strip guide, viz, long, medium, and short, according to the thickness of the strip guide at the point of assembling. The length desired should be stated. There are loading-tool levers, left, and loading-tool levers, right. The kind desired should be stated in the requisition.

## THE RESIZING TOOL.

[Plate XIX.]

The resizing-tool frame is made with a handle at each end. In the center is a deep cut for the feed strip, while just above is the seat for

the resizing-tool roller support. On the bottom are the four holes for the blocking screws. The resizing-tool roller support is assembled to the frame with two adjustment screws, the four blocking screws abutting against the underside of the support. In the center of the support are two lugs to which the roller and its axis are assembled.

To use the resizing tool, loosen the adjusting screws and raise the support if necessary, by the blocking screws, until a feed strip can be easily inserted. The feed strip should be inserted in the open side of the support with center clips pointing to the rear. The support should be so adjusted that the roller will force the center clip over sufficiently so that the cartridge will be firmly held in the feed strip. A piece of metal about the thickness of a penny (0.05) inserted under the support will give the proper gage. Several trials will probably have to be made before the proper adjustment is obtained. When a vise is accessible, it will be found most convenient to hold the resizing tool firmly in the vise, with a man on one side pushing the strips into the resizing tool and another on the opposite side pulling them through the tool.

The feed strips should be resized whenever it is noticed that the cartridges are not being firmly held. It will usually be found best to resize feed strips at each reloading, though some strips can be used a number of times without resizing.

#### LOADING-TOOLS CASE.

This article is made of leather and carries the tools shown on page 66. It is intended to be lashed to the top of the pack frame when on the road, but can be carried by the soldier as well.

#### GUNNERS' POUCH.

The gunners' pouch is designed to carry the articles shown on page 68. For transportation it is ordinarily carried in a leather pocket on the underside of the rifle case, but in action it should be carried by a soldier on his belt.

## PART II.—PACK HARNESS.

The group of parts of the pack outfit used for leading the animal and carrying the load with its special holders is called the "pack harness." It consists of the blinder, halter bridle, corona, saddle blanket, aparejo, sobrejalma, crupper, and aparejo cincha.

These parts are common to all aparejo outfits and may be used without special frames for packing bundles and boxes.

### BLINDER, MODEL OF 1916.

A pack mule is ordinarily blinded during harnessing and unharnessing, loading and unloading. The blinder consists of an inner and an outer piece of harness leather stitched together around the outer edges and joined in the rear by leather thongs, the whole shaped to fit closely around the animal's eyes.

### HALTER BRIDLE, MODEL OF 1910.

This article is designed to furnish a light, strong head harness for a mule. When leading the animal on the march, the bit and its straps are removed from the headstall and fastened to any convenient place on the pack frame. The two snaps of the lead rein are then fastened to the floating ring, the body of the rein forming a loop convenient for holding in the hand.

In riding the animal the lead rein is used in combination with the bit, headstall, and bit straps as a bridle.

When a mule is picketed to a line, the lead rein serves as a halter strap.

The bit is made of nickel steel to prevent rusting.

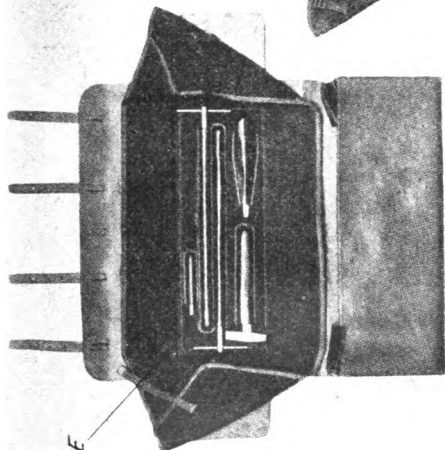
### CORONA, MODEL OF 1910.

The corona is the first piece of harness placed on the mule's back. It is a saddle pad made of four thicknesses of good quality gray flannel blanket, protected from sweat by a lining of cotton duck. The corona is made in three sizes, and each size is stenciled on the underside to correspond with the size of the aparejo it is intended to accompany. The width is 26 inches for all sizes. In placing the corona it is laid well forward on the mule's back, canvas side down, and then slid to the rear until its front edge is just behind the point of the withers, care being taken that the hair lies smooth beneath it.

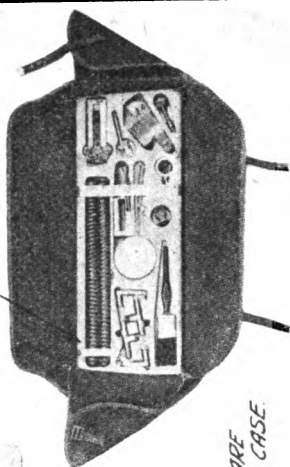
When manufactured in quantity, 10 per cent are 58-inch, 15 per cent 60-inch, and 75 per cent 62-inch.



TOOL CASE



PACKING BLOCK



SPARE  
PARTS CASE

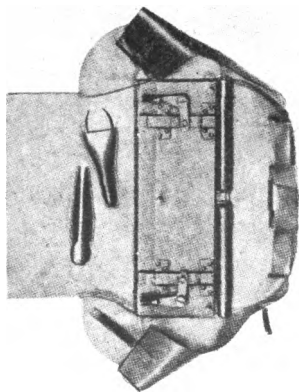
SHORT CHAFING  
STRIP



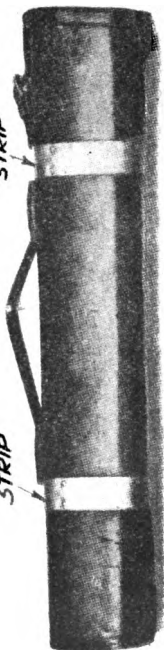
GUNNER'S POUCH

BELT ATTACHMENT

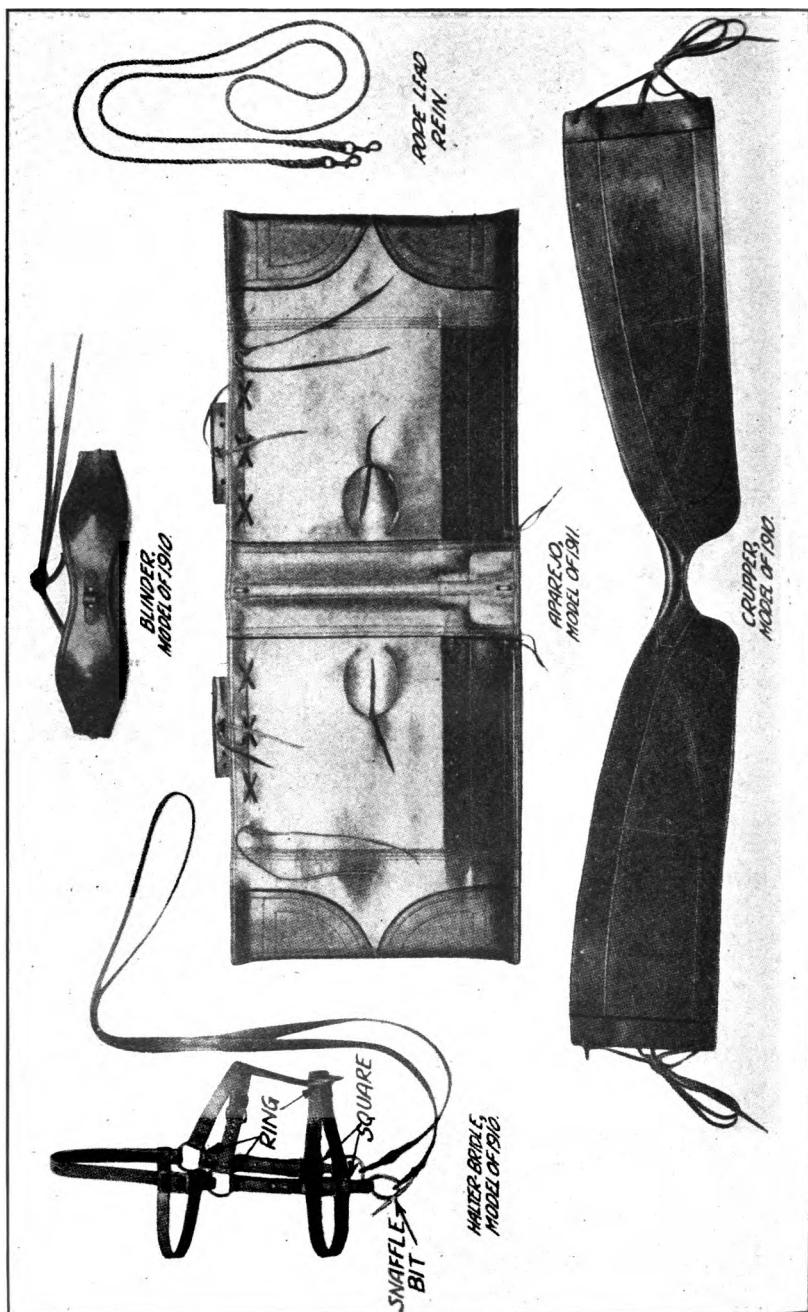
LOADING  
TOOLS CASE



LONG CHAFING  
STRIP



SPARE BARREL CASE



### THE SADDLE BLANKET.

The saddle blanket forms additional padding under the aparejo. It is carried under the aparejo and over the corona.

The blanket is made of pure wool of olive-drab shade, with an olive-brown border of two stripes. The blankets are rectangular, 72 by 84 inches. Each blanket has the letters "U. S." and the bursting shell located in the center.

### APAREJO, MODEL OF 1911.

This article consists of an aparejo body and one aparejo frame. The aparejo body is made of two rectangular pieces of leather (back and belly pieces) sewed together along the edges and through the middle, forming two pouches. The edges, the middle seams, and particularly the ends are reinforced with heavy leather facings. Handholes for stuffing are left in the belly pieces, and holes and slits laced with thongs are made in the back pieces, so that the frame, or parts of it, may be inserted, removed, or replaced. The carrier pieces and front facings have lacing holes for the attachment and adjustment of the crupper. Two steel chock staples attach the sobrejalma and pack frame to the aparejo. The rib sticks are furnished longer than necessary and should be sawed off to the proper length after the boot and top sticks are firmly rammed home. The first three sticks (starting at the front) are of uniform thickness. The remainder are tapered to give the rear of the aparejo more flexibility than the front. The sticks are stamped and are intended to be arranged in a gradually diminishing thickness.

Cloth is tacked to the top stick to prevent the hay from slipping down.

NOTE.—Aparejos are issued to the service with ribs in place. They are furnished in 58, 60, and 62 inch sizes, as follows: 10 per cent, 58-inch; 15 per cent, 60-inch; and 75 per cent, 62-inch. Should repairs or alterations make it necessary to rib up, the butt of the fifth rib is seated in its slot, the overlap at its slot in the top stick is marked and cut away, and the other ribs are cut to the exact resulting length.

### SOBREJALMA, MODEL OF 1910.

This article is a waterproof and wear-reducing covering for the aparejo. It is made of one thickness of heavy cotton duck faced around the edges on the upper side with collar leather. Two leather reinforces are placed on the upper side to protect the duck from the wear of the load. Holes are provided through which the chock staples of the aparejo protrude; chock straps passing through these chock staples hold the sobrejalma and pack frame on the aparejo.

Sobrejalmas are made in three sizes, and when manufactured in quantity 10 per cent are 58-inch, 15 per cent 60-inch, and 75 per cent 62-inch. The size stamped on the sobrejalma is the size of the aparejo for which it is suited.

#### CRUPPER, MODEL OF 1912.

The crupper is made of russet collar leather, shaped (and padded in the middle) to fit the animal. The side pieces extend forward, across the aparejo, and are laced to it in front and held up at rear by latigo-leather thongs. The depth of the side pieces affords a broad surface to bear against the animal and also prevents the crupper from sagging. The side pieces are reinforced with leather, and those portions which come in contact with the animal's flanks are lined with duck. Cruppers are made in one size only, 78 inches long.

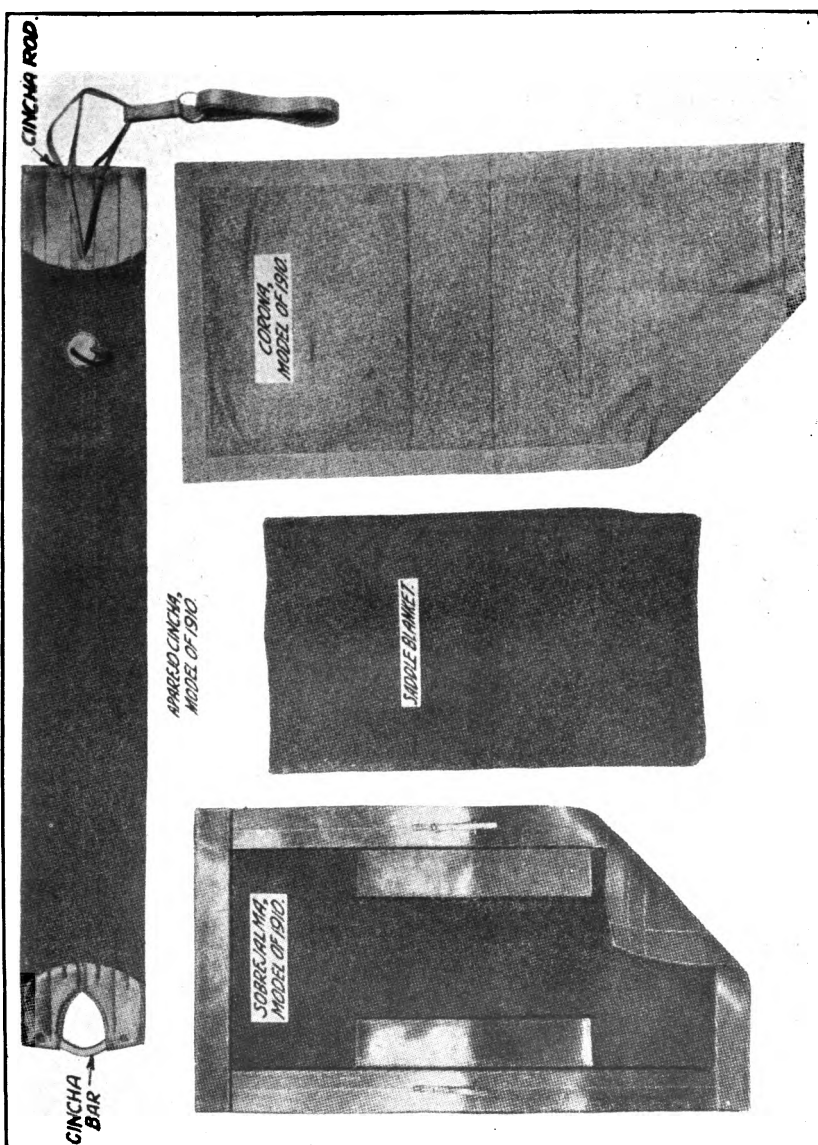
#### APAREJO CINCHA, MODEL OF 1910.

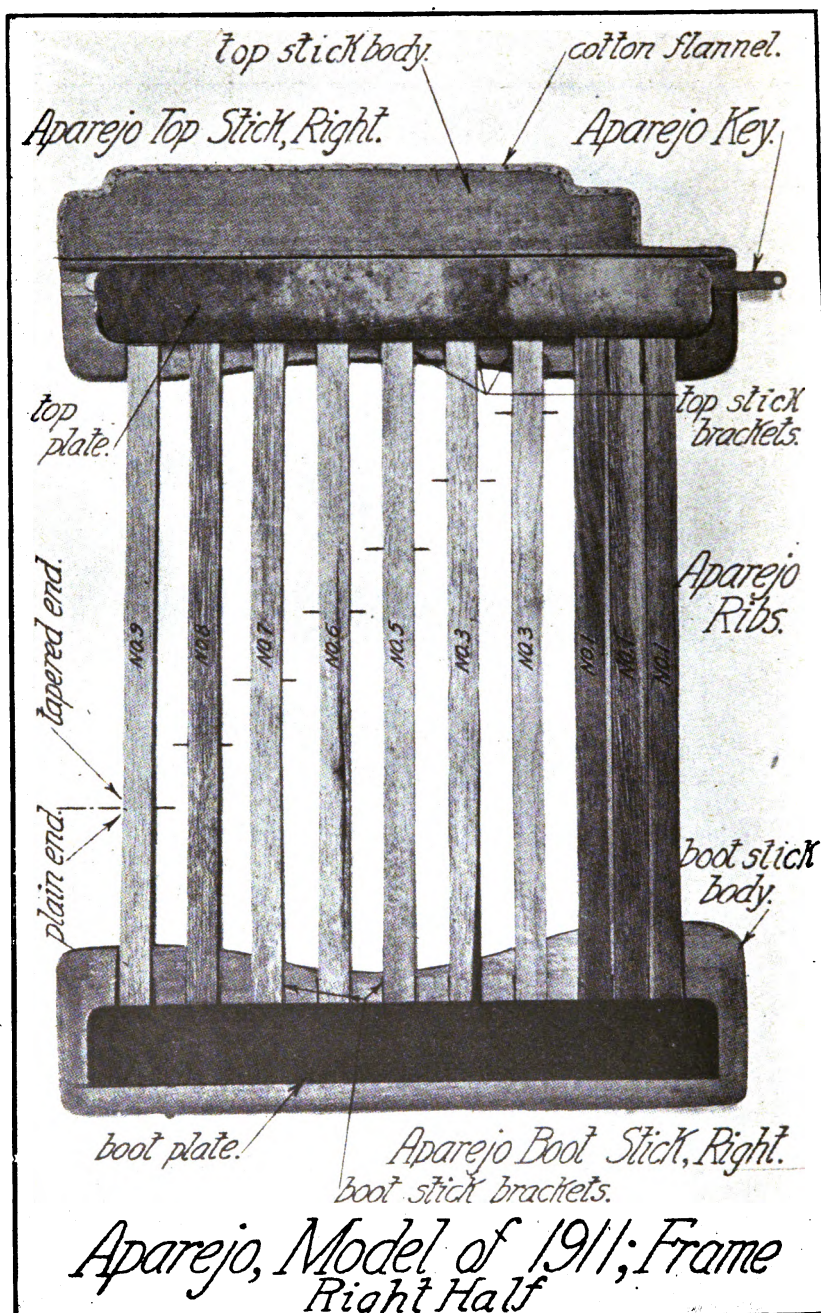
The aparejo cincha is 10 inches wide and is made of cotton duck, folded and stitched along the middle. Both ends are faced with leather, and the end to which the cincha strap is fastened carries a five-sixteenth-inch steel rod in the fold of the lacing-end piece, while the other end has a curved piece of gas pipe (cincha bar). Fifteen inches from the strap end of the cincha a leather thong (finger loop) is attached, which is used to carry the slack of the cincha strap. The cincha strap is of harness leather and has a rendering ring at one end; this end is attached to the cincha body by a latigo-leather thong. The metal parts are either of bronze or are copper plated to prevent rotting of the leather. The cincha is made in three sizes and when manufactured in quantity 10 per cent are 58-inch, 15 per cent 60-inch, and 75 per cent 62-inch. The size stamped on the cincha is the size of the aparejo for which it is designed.

#### INSTRUCTIONS FOR SETTING UP THE APAREJO.

*To rib up.*—Unlace the slits and handholes; soak the aparejo in tepid water for about 15 minutes; drain it and lay flat; back pieces up; insert the boot stick and the top stick through the slit in rear and press them to their places at the boot and the center stitch line, slotted sides up; insert the numbered set of nine ribs through the slit in rear in their numerical order and seat them in that order from collar to rear in the slots of the boot stick and top stick, butts at the boot; secure the top of each rib as it is seated by inserting the aparejo key at the front edge below the collar and passing it over the rib in place; fasten the key bar to the collar by the thong.

NOTE.—The aparejo, after being set up, should under no circumstances be allowed to dry in the sun.







*To fill or pad.*—Turn the aparejo over, belly pieces up; procure about 6 pounds of long, fine, soft, elastic hay; taking a little at a time, tease or “mix” it carefully; insert it through the handhole and thus gradually fill the body of the aparejo with a smooth and even layer not more than 2 inches thick.

**NOTE.**—Other filling may be used in necessity, such as moss, excelsior, curled hair, or sea grass; but these substitutes are difficult of manipulation in alterations necessary to accommodate the rigging to injuries of the mule. By teasing or “mixing” is meant the arrangement of the stalks of the hay so that they will cross one another. The body of the aparejo is that part which comes in contact with the body of the mule. As 3 inches of the lower portion of each boot stick and 3 inches of the upper portion of each top stick *must not* come into contact with the mule, no filling should be pressed under the boot stick or within 3 inches of the center of the stitch line. The body course tapers, however, so as to overlap the boot stick and saddle bar, and also tapers toward front and rear.

*To face or dress.*—To adjust the aparejo more accurately to the shape of the mule, introduce filling and press it well into the corner of the front boot; working toward the handhole, continue the facing along the boot stick and front edge, gradually increasing its thickness to about 1 inch at 7 inches from the corner and forming its inner edge into the arc of a circle concentric with the handhole, the thickness tapering to the ends of the arc; continue this for 3 inches more toward the handhole, rapidly decreasing the thickness to nothing. Proceed in exactly the same way at the collar; under no circumstances should the collar facing reach within 7 inches of the center of the handhole. Connect the front boot and collar facings by a dressing along the front edge about 3 inches wide and 1 inch thick, decreasing in thickness toward the handhole and toward the middle of the edge.

**NOTE.**—In facing up introduce the filling with the palm of the hand up, so as not to disturb the body course. In case the leather will not yield enough to permit the filling to be introduced well into the corners, a tamping stick may be used to raise it. This stick, used with the commercial aparejo, is 4 or 5 feet long, 1½ inches in diameter, wedge-shaped for 4 inches from one end, the edge of the wedge being about ½ inch thick and grooved. The object of the boot facing is to cause the boot stick to carry horizontally and parallel to the center of the mule and to give free action to the mule’s elbow. Mules of large barrel will require a thicker facing than described. The object of the collar facing is to cause the saddle bar to carry horizontally and parallel with the center of the mule and to protect the mule’s withers. Mules with high withers will require a thicker facing than that described. In setting to the shape of the mule, the aparejo bends at the middle of the front edge. It is important that the

body course remain undisturbed during dressing, and that the instructions given be carefully followed to avoid sore withers or tails and body or belly bunches.

*To attach the crupper.*—Stand the aparejo on its boots in its normal position; secure a lace thong to the front hole on the upper facing of the crupper on each side and fasten the crupper with short thongs to the center holes of the carrier pieces on the rear of the aparejo; pass the crupper lace thong through the second hole from the top of the front facing of the aparejo, through the second hole of the crupper, through the third hole of the aparejo facing, through the fourth hole of the crupper, and so on, finishing through the bottom holes of the facing and crupper and tying to the crupper hole.

NOTE.—In lacing the crupper to the aparejo, the thong must be passed through the holes from the outside and must not be twisted, the lacing must not cross, and it is important that the tie be made on the last hole of the crupper instead of the aparejo.

Guayaba, willow, dogwood, hickory, or any other wood combining the qualities of permanent elasticity and strength may be used to replace broken ribs. When the set-up aparejo is to be filled, no soaking is necessary; instead, the belly pieces are made pliable by rubbing with a sponge.

Mules weighing 850 to 900 pounds require a 58-inch aparejo; 1,000 pounds, 60-inch; 1,100 pounds, 62-inch.

When the mule is loaded, the cincha, in travel, should free the elbow by about 1 inch; more than this will prevent a proper grip on the belly.

If the boots ride high enough on the body of the mule, or if they reach under the belly, even though they ride horizontally and parallel to the center of the mule, the aparejo will be likely to turn easily. This fault encourages injuriously tight cinching.

If one or both boots flare out or turn in toward the mule, cinch sores, sore tails, or belly bunches are caused.

The width of the collar-arch clearance should be at least 5½ inches. If it is too narrow or too wide, or if the saddle bars slope downward toward the front, there will be sores on the withers; if they slope to the rear, there will be injuries over the loins called "kidney sores."

If the lacing of the crupper is drawn too tight at the bottom, the lower edge of the crupper will rub the buttocks and cause abrasions.

The object to be attained is the uniform distribution of the weight of a load over that portion of the mule's body which is anatomically suited to the carrying of a burden, so that the saddle will ride with little motion and without friction of the bearing surface on the body. The contact of the bearing surface of the saddle must be close at all points. As the mule's body swells from front to rear, the more or less cylindrically shaped aparejo, after the body course is laid, must be



modified by facing up so as to provide a concave surface to fit over the convex surface. But as the barrel of the properly conformed mule is nearly cylindrical through the rear half or more of the contact surface, no facing, as a rule, is necessary in the rear part of the aparejo, although conformation may require it occasionally. The above instructions were prescribed by H. W. Daly, chief packmaster, Quartermaster's Department.

#### CARE OF RUSSET LEATHER.

Leather equipments which have become wet should be dried in the shade. Wet leather exposed to the direct rays of the sun or to the heat of a stove or radiator becomes hard and brittle. *Only cool or lukewarm water should be used on leather; the use of hot water is prohibited.*

When russet-leather equipments become soiled in service they should be cleaned by carefully washing the leather with a sponge moistened with a heavy lather made of clean water and castile or Frank Miller's soap, and then rubbing vigorously with a dry cloth until the leather is completely dry.

If the leather becomes harsh, dry, and brittle from exposure to water or other causes, clean as above described, and while the leather is still slightly moist apply an exceedingly light coat of neat's-foot oil by rubbing with a soft cloth moistened (not *saturated*) with the oil. If it is found that too much oil has been used, the surplus can be readily removed by rubbing with a sponge moistened with gasoline, but this oil is not issued.

Where a polish is desired, the leather should first be thoroughly cleaned and then the leather polish or dressing supplied by the Ordnance Department should be applied sparingly and thoroughly rubbed in with a soft, dry cloth. Scars, cuts, or abrasions of the leather may be improved in appearance but not obliterated by similar use of the leather polish.

Russet leather may be cleaned, oiled, and polished as described above, but it should be noted that if more than a light coat of oil be given the leather will be greatly darkened and will quickly soil the clothing. No method of cleaning will restore the original light color of the leather or remove stains or discolorations.

### **PART III.—THE SPECIAL PACK EQUIPMENT.**

This equipment includes the following:

Pack frame.	Cooling-sponge cover.
Ammunition hanger.	Rigging cover.
Rifle hanger.	Picket pin and eye.
Rifle case.	Picket rope section.
Broad-hatchet head case.	Thongs.

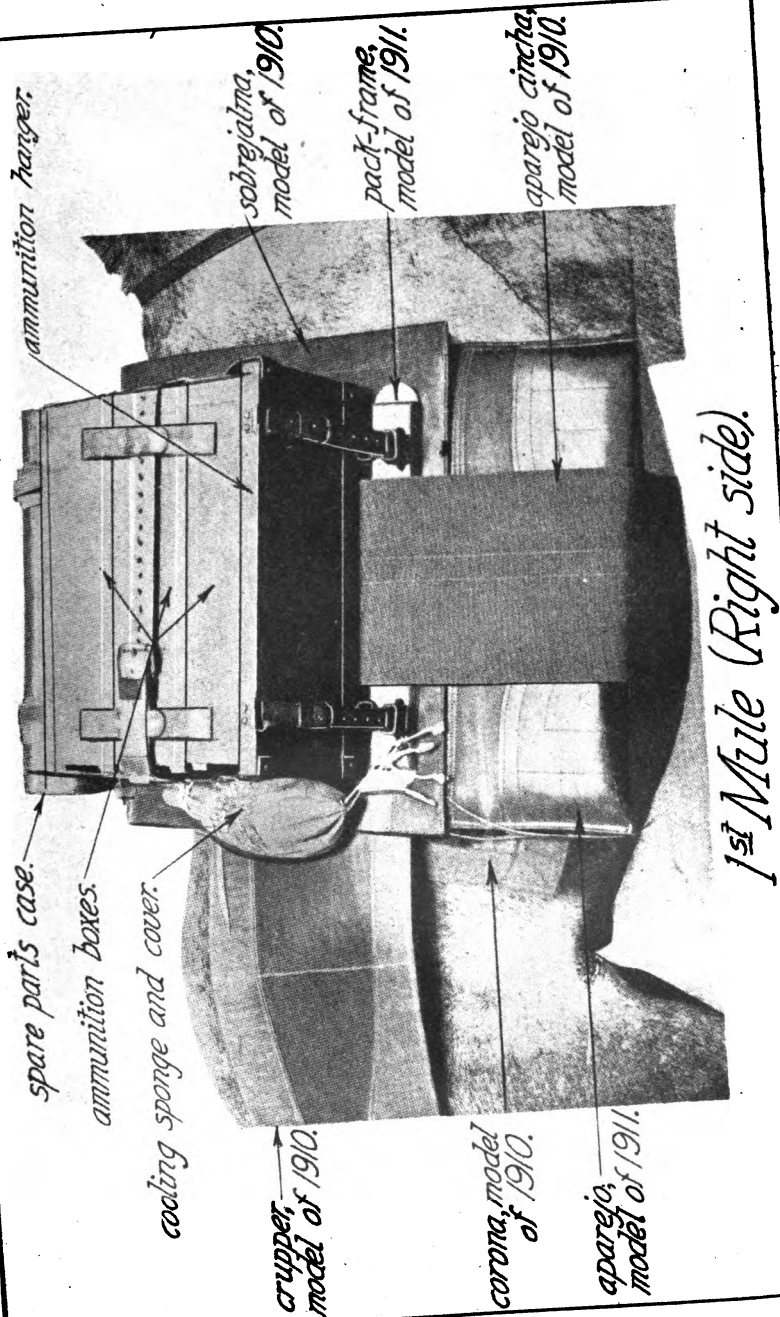
Plates 25 to 30, inclusive, show the special pack equipments with their loads attached placed on the pack harness for the first, second, and third mules. The loads for the other mules are similar to these except as shown in the table of equipment.

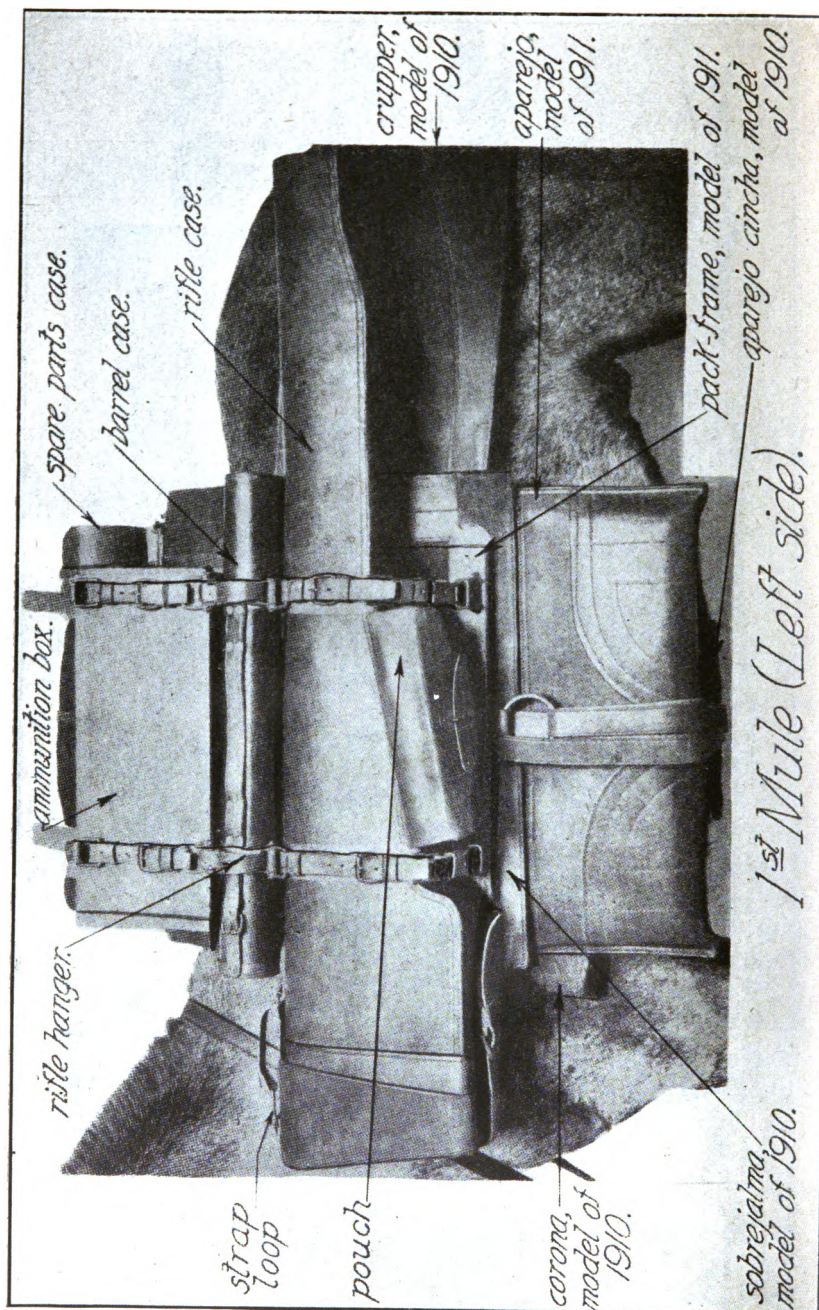
#### **PACK FRAME.**

This article consists of a framework built up of wood and metal to carry the weight of the load and distribute it uniformly over the carrying surface of the aparejo. It is arranged to suit the load to be carried. To the top of the pack frame are attached four bronze castings, known as superframes, which, when folded up, form a flat surface for carrying boxes or packages which have flat sides, or, when folded down, form a convenient receptacle to hold picket pins, shovels, picket ropes, or other items of a similar nature. Four steel-loop cleavices with straps are fastened to the top of the pack frame, furnishing means of lashing articles to the frame. The steel arches, with the bronze superframes, are interchangeable and may be removed by withdrawal of the steel pins. The sides of the pack frames are riveted together. The hook hinges are made of forged steel and are arranged for hanging boxes or hangers on the sides of the pack frame. Four pack-frame staples are fastened to the brace bar and are used for holding down side loads.

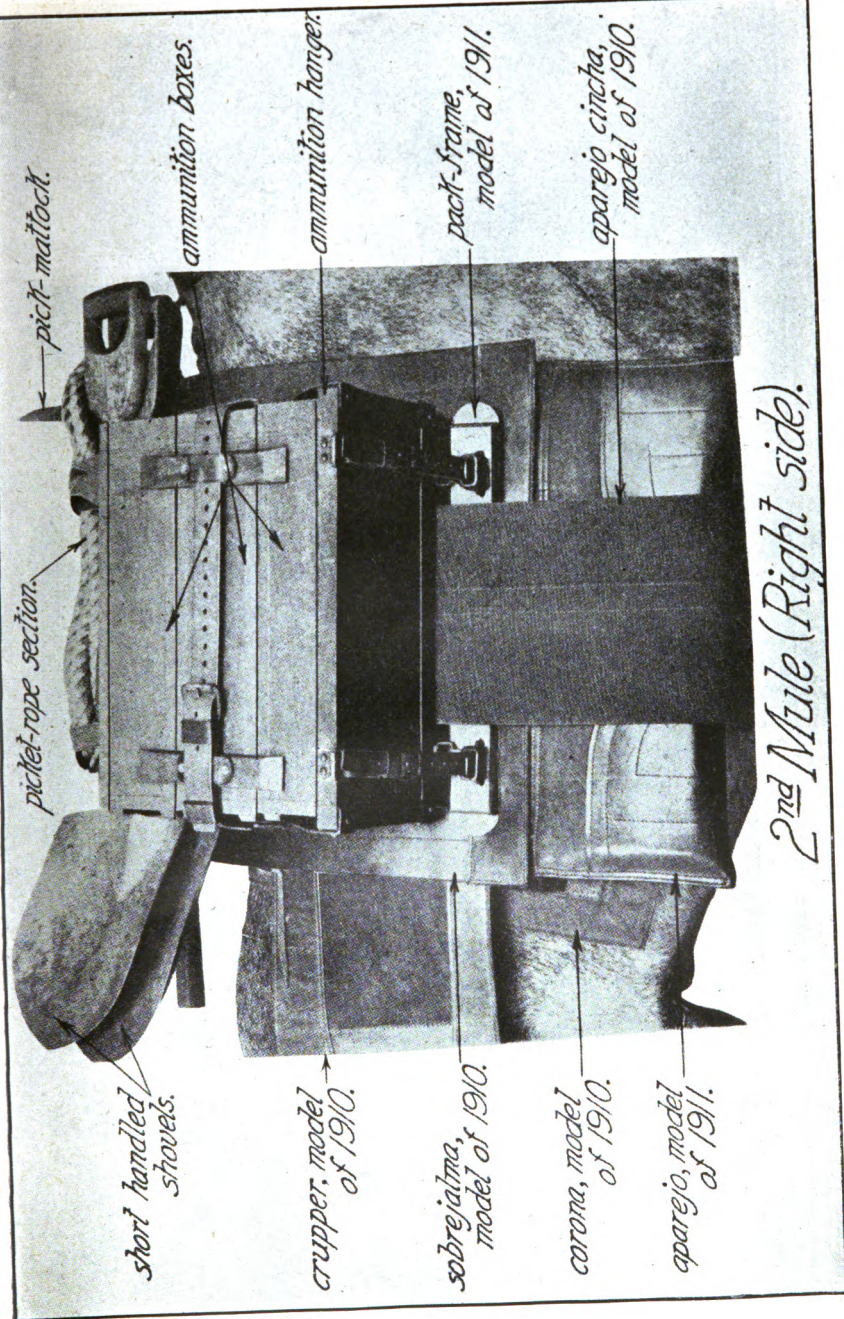
#### **AMMUNITION HANGER.**

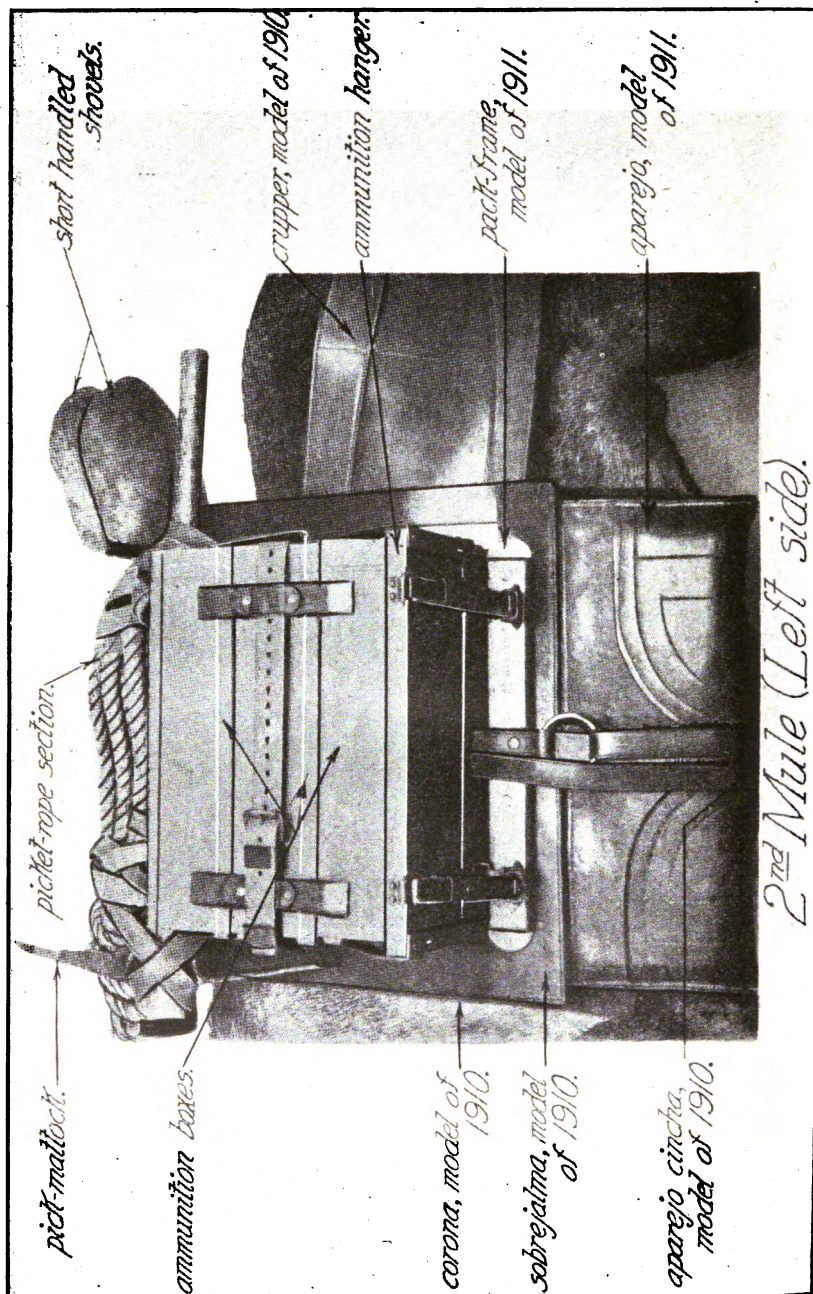
This article consists of a light steel frame for carrying ammunition boxes. The steel loops at the top of the hanger are elongated to facilitate attaching the hanger to the pack frame. The straps which lash the boxes in place are provided with quick-release devices. Straps with quick-release devices are provided to fasten the hanger to the pack frame.

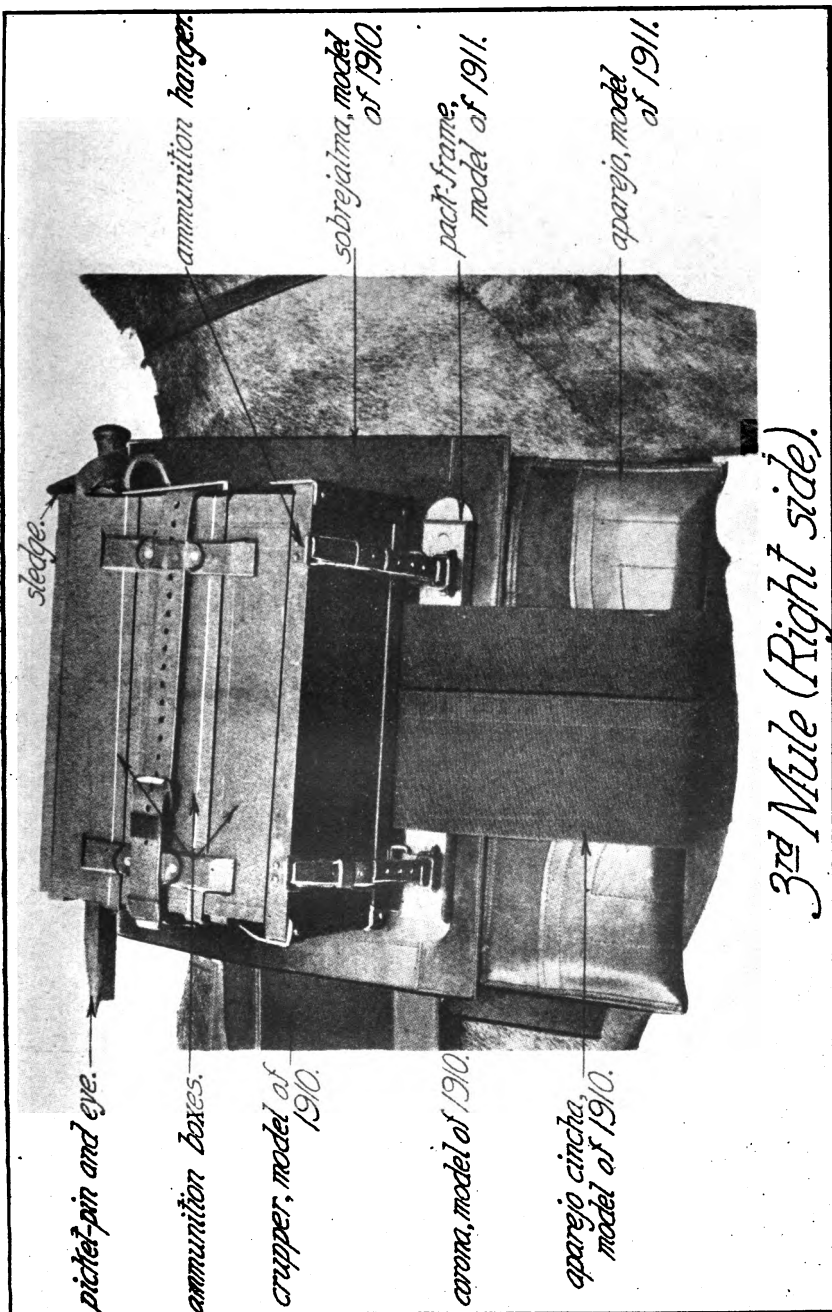




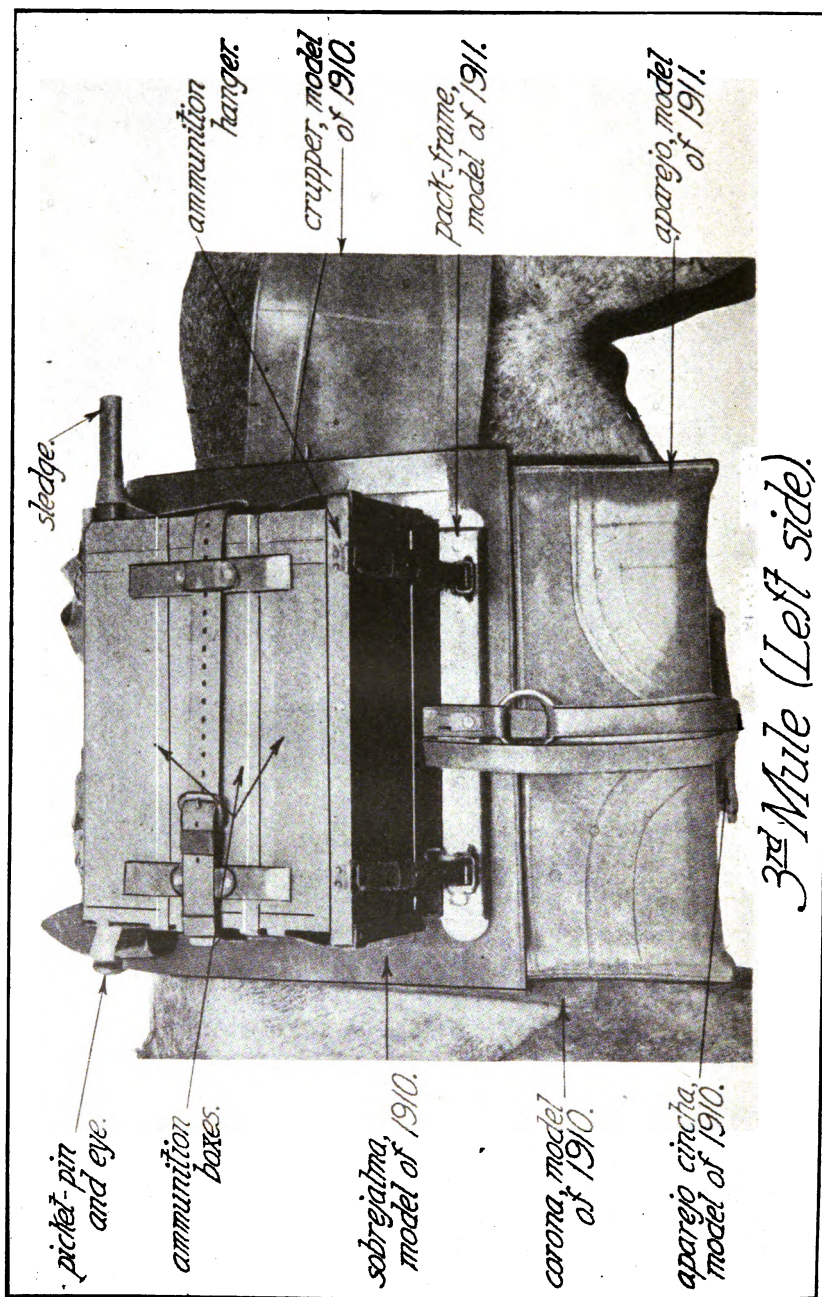




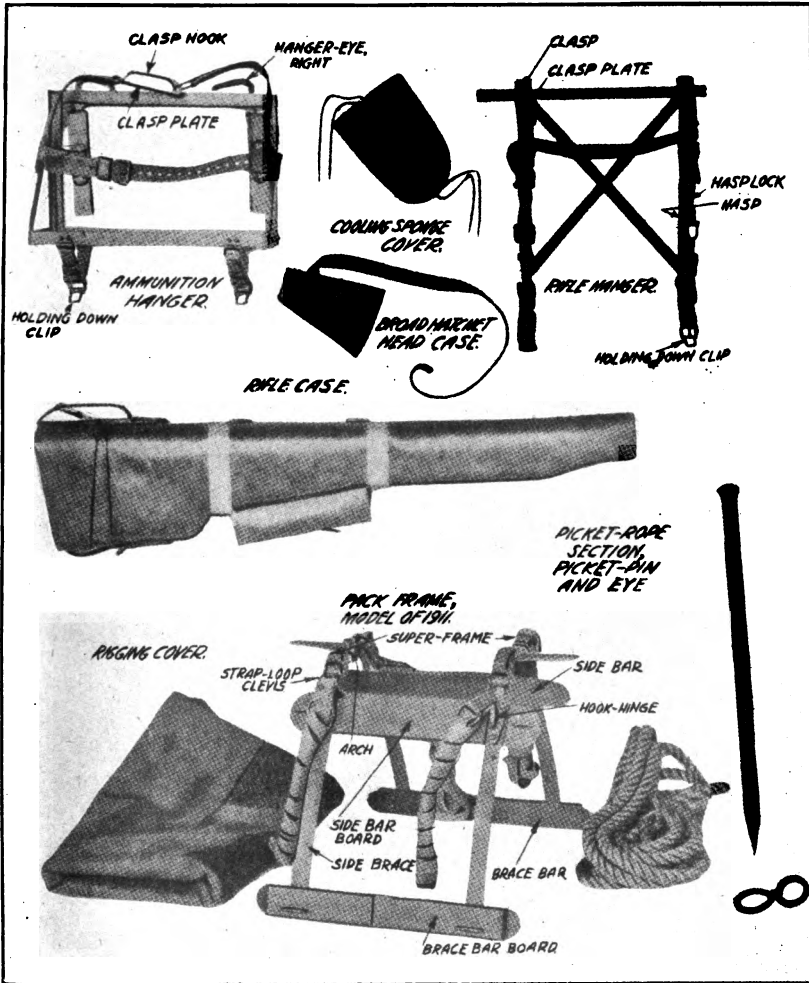














## RIFLE HANGER.

This article consists of a steel frame for carrying the rifle case, the barrel case, and a box of ammunition. Quick-release devices are provided for facilitating the removal of the ammunition and the barrel case. As the rifle case is not designed for use away from the packed animal, it is fastened to the hanger with straps and without any means of quick removal. Holding-down straps with quick-release devices are provided to fasten the hanger to the frame. The quick-release devices on the bottom straps are to facilitate the removal of the hanger should a mule fall. Small projections on the back of the hanger are to keep the load away from the aparejo cincha and to form a bearing against the side braces of the pack frame.

## RIFLE CASE.

This case or pouch is made of sole leather and its purpose is to protect the rifle from damage in transportation and from the weather. It is arranged in such a way that the rifle may be removed with great ease and rapidity. The small end of the case contains an oak block lined with brass, designed to hold the rifle in position. The cover contains a bronze stop, designed for the same purpose. Guides are placed at the sides to keep the rifle from touching the leather. Brass reinforces are riveted to the inside of the case to strengthen and stiffen it. The pouch at the bottom of the case is designed to take the gunner's pouch. The flap of this pouch is fastened with a billet of leather, passing through a staple. The brass guards on the outside of the case are to prevent the leather from coming in contact with the metal rifle hanger.

## BROAD-HATCHET HEAD CASE.

This case, as its name implies, is designed to protect the head of the broad hatchet and to form a convenient means of carrying that tool. A strap with a ring is riveted to the flap of the case to form a convenient means of lashing the broad hatchet to the top load of the pack.

## COOLING-SPONGE COVER.

This article consists of a small bag with a short length of seine twine fastened at the bottom and a drawstring of seine twine at the top. It is designed to protect the sponge from becoming damaged in transportation and to prevent other adjacent articles from being soiled by the sponge. The loops of seine twine are designed to furnish a convenient means of fastening the article to the pack in transportation.

**RIGGING COVER.**

The rigging cover, made of olive-drab duck, is 43 inches wide and long enough to cover the eight packs of two sections when in park.

**PICKET PIN AND EYE.**

The picket pin and eye are made of steel. One picket pin and eye is furnished each section.

**PICKET-ROPE SECTION.**

This article consists of a 1-inch diameter manila rope, 25 feet long, with a loop spliced on each end. It is designed to be stretched along the ground and fastened at the ends with pins. The animals can then be fastened by means of their halter-bridle reins to this rope in the usual way. Three picket-rope sections are provided for each company or troop. Two sections of rope can be fastened together by means of the loops and a pin driven at each end. If it is necessary to use the sections separately, a shovel or pick mattock could be used as a "deadman."

#### **PART IV.—PIONEER TOOLS.**

Broad hatchets .....	3
Pick mattocks .....	3
Short-handled shovels .....	6
Rule, 2-foot .....	1

These tools are commercial articles. They are carried as prescribed on Plates XVI to XXI and in the list of total equipment.

#### **PART V.—TOTAL EQUIPMENT OF ONE MACHINE-GUN COMPANY OR TROOP.**

The following table sets forth the total equipment of one machine-gun company or troop armed with the Benet-Mercié machine rifle, model of 1909. It shows, in general, where each article should be carried, but the commander may use his discretion as to the disposition of articles for which no particular fitting or receptacle is provided.

In making requisitions for any of these parts the names used should be those used in this table, or on the plates, or in the descriptive matter of this handbook. If an article is wanted which is not shown as a whole but shown as made up of component parts, these component parts should be stated.

*Statement of total equipment of 1 machine-gun company or troop, armed with the Benet-Mercié machine rifle, model of 1909.*

Article.	Weight of each.	First section.					Second section.					Third section.					Fourth section.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																													
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<i>The rifles, with ammunition and accompanying parts, include—</i>  Rifle..... Ammunition (300 rounds in box) <sup>1</sup> ..... Ammunition box, with 10 feed strips <sup>2</sup> ..... Gunner's pouch, with contents <sup>3</sup> ..... Loading-tool case, with contents <sup>3</sup> ..... Spare-parts case, with contents <sup>3</sup> ..... Cooling sponge..... Latigo strap, ¾ inch by 8 feet..... Spare barrel..... Spare-barrel case <sup>3</sup> .....  <i>The packs for 1 company or troop include—</i>  <i>The pack harness:</i> Blinder..... Halter bridle <sup>4</sup> ..... Corona..... Saddle blanket..... Sobrejalma..... Aparejo, including hay, 6 pounds <sup>5</sup> ..... Aparejo cincha..... Crupper..... <i>The special pack equipment:</i> Pack frame <sup>6</sup> ..... Ammunition hanger <sup>7</sup> ..... Rifle hanger <sup>8</sup> ..... Rifle case..... Broad hatchet-head case..... Cooling-sponge cover..... Picket pin and eye..... Picket-rope section..... Rigging cover..... Thongs, 0.375 by 30 inches.....	30.00	1				1	1,800	1,800	1,800	1,200	1,800	1,800	1,800	1,200	1,800	1,800	1,800	1																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																												

	Weight	Volume	Number	Weight	Volume	Number
The pioneer tools:						
Broad hatchet.....	3.00	1	1	292.09	301.59	301.59
Pick mattock.....	7.00	1	1	302.79	301.59	301.59
Short-handled shovel.....	5.00	3	3	310.75	301.59	301.59
Total weights.....	310.75	309.79	286.47	301.59	305.93	291.97

**Telescopic sight, model of 1908.**

**Pouch, model of 1911 for telescopic sight, model of 1908.**

<sup>1</sup> The ammunition is not issued as part of the 6 rifles.

3 For the troop the load is habitually reduced by the removal of 2 boxes of ammunition, one from each side of the mule. The full load, however, may be carried when conditions warrant.

### 3 Inclusions

4 A halter bridle includes either 1 leather rein or 1 rope rein; 12 leather and 12 rope reins are supplied to each company or troop.

<sup>5</sup> The hay is not furnished with the aparejo.

One aparejo consists of—

- 1 aparejo body.  
 1 aparejo frame.  
 2 thongs  $\frac{1}{2}$  by 64 inches.  
 2 thongs  $\frac{1}{2}$  by 20 inches.  
 2 thongs  $\frac{1}{2}$  by 16 inches.  
 2 thongs  $\frac{1}{2}$  by 14 inches.  
 One aparejo frame consists of—  
 1 aparejo top-stick body, right.  
 1 aparejo top-stick body, left.  
 1 aparejo boot-stick body, right.  
 1 aparejo boot-stick body, left.  
 2 aparejo body.  
 2 aparejo kevs.

**6 One pack frame consists of—**

- 4 pack-frame top straps.  
2 pack-frame sides.  
2 arches.  
4 superframes.  
4 pack-frame pins.  
4 split pins.  
4 strap-loop devices.  
1 ammunition hanger consists of—  
1 ammunition hanger body.  
2 holding-down straps.  
2 holding-down clips.  
2 0.1 by 0.5 inch strap loops.  
1 ammunition-strap clasp billet (with  
1 ammunition-strap buckle billet.  
1 ammunition-strap loop billet.  
2 ammunition-box retainers.

<sup>8</sup> One rifle hanger consists of—

- 1 rifle-hanger body.
- 1 rifle-hanger case strap, front.
- 1 rifle-hanger case strap, rear.
- 2 rifle-hanger ammunition straps.
- 2 rifle-hanger holding-down straps (1 front and 1 rear).
- 2 rifle-hanger hasps.
- 2 rifle-hanger hasp locks.
- 4 rifle-hanger clevises.
- 4 rifle-hanger clevis pins.
- 2 holding-down clips.
- 2 0.1 by 0.5 inch strap loops.
- 4 split pins.

*Statement of total equipment of 1 machine-gun company or troop, armed with the Benet-Mercié machine rifle, model of 1909—Continued.*

Article.	Weight of each.	Fifth section.					Sixth section.				Total for each company or troop.	Property classification.					
		Mules.					Mules.					Class.	Section.				
		17	18	19	20	21	22	23	24								
<i>The rifles, with ammunition and accompanying parts, include—</i>																	
Rifle.....	30.00	1	1,800	1,800	1,800	1,200	1,800	1,800	1,800	6	IV	39,600	IV	1			
Ammunition (300 rounds in box).....	16.95	1,200	4	6	6	4	6	6	6	132							
Ammunition box, with 10 feed strips.....	9.08	1	1	1	1	1	1	1	1	6							
Gunner's pouch, with contents.....	2.08	1	1	1	1	1	1	1	1	6	IV	3	IV	1			
Loading-tool case, with contents.....	12.57	1	1	1	1	1	1	1	1	3							
Spare-parts case, with contents.....	17.39	1	1	1	1	1	1	1	1	3							
Cooling sponge.....	.53	1	1	1	1	1	1	1	1	6	IV	6	IV	1			
Latigo strap, $\frac{1}{2}$ inch by 8 feet.....	.10	1	1	1	1	1	1	1	1	6							
Spare barrel.....	9.50	1	1	1	1	1	1	1	1	6							
Spare-barrel case.....	4.81	1	1	1	1	1	1	1	1	6	IV	6	IV	1			
<i>The packs for 1 company or troop include—</i>																	
<i>The pack harness:</i>																	
Blinder.....	4.33	1	1	1	1	1	1	1	1	1	IV	18	IV	1			
Halter bridle.....	6.50	1	1	1	1	1	1	1	1	1							
Corona.....	5.00	1	1	1	1	1	1	1	1	1							
Saddle blanket.....	7.00	1	1	1	1	1	1	1	1	1	IX	24	IX	5			
Sobrejalma.....	47.09	1	1	1	1	1	1	1	1	1							
Aparejo, including hay, 6 pounds.....	4.84	1	1	1	1	1	1	1	1	1							
Aparejo cincha.....	5.55	1	1	1	1	1	1	1	1	1	IV	24	IV	1			
Crupper.....	20.30	1	1	1	1	1	1	1	1	1							
The special pack equipment:	11.25	1	2	2	2	1	2	2	2	2							
Pack frame.....	12.66	1	1	1	1	1	1	1	1	1	IV	42	IV	1			
Ammunition hanger.....	16.69	1	1	1	1	1	1	1	1	1							
Rifle hanger.....	.50	1	1	1	1	1	1	1	1	1							
Rifle case.....	.11	1	1	1	1	1	1	1	1	1	IV	3	IV	1			
Broad hatchet-head case.....	12.38	1	1	1	1	1	1	1	1	1							
Cooling-sponge cover.....	8.20	1	1	1	1	1	1	1	1	1							
Picket-pin and eye.....	12.50	6	6	6	6	6	6	6	6	6	IV	4	IV	1			
Picket-rope section.....	.05	6	6	6	6	6	6	6	6	6							
Rigging cover.....		6	6	6	6	6	6	6	6	6							
Thongs, 0.375 by 30 inches.....		6	6	6	6	6	6	6	6	6	IV	144	IV	1			
		6	6	6	6	6	6	6	6	6							
		6	6	6	6	6	6	6	6	6							





*Statement of total equipment of 1 machine-gun company or troop, armed with the Benet-Mercié machine rifle, model of 1909—Continued.*

Article.	In each gunner's pouch.	In each loading-tools case.	In each spare-parts case.	Total.	Numbers as shown on plates.	Carried on mules, Nos.	Property classification.		
							Class.	Section.	
<i>Tools and accessories for rifles.</i>									
Ammunition boxes.....				132		1-24 inc.	IV	1	
Arm chests.....				3					
Cooling sponges <sup>1</sup> .....				4	178	1, 5, 9, 13, 17, 21			
Cleaning brushes.....	2		8	36	174	1, 5, 9, 13, 17, 21			
Cleaning-brush holders.....	1			6	154	1, 5, 9, 13, 17, 21			
Cleaning-rod handles (with sleeves).....	1			6	152	1, 5, 9, 13, 17, 21			
Cleaning-rod stems (with sleeves).....	1			6	153	1, 5, 9, 13, 17, 21			
Cut patches (cotton flannel).....		100		300		5, 13, 21			
Cut patches (Tampa flannel).....		100		300		5, 13, 21			
Defective cartridge extractors.....	1			6	156	1, 5, 9, 13, 17, 21			
Dismounting tools.....	1			6		1, 5, 9, 13, 17, 21			
Dismounting wrenches.....	1			6	145	1, 5, 9, 13, 17, 21			
Drifts, bronze.....			1	3	160	1, 9, 17			
Ejector keys.....	1			6	146	1, 5, 9, 13, 17, 21			
Feed strips <sup>2</sup> .....				1,320	175	1-24 inc.			
Gas-cylinder cleaners, complete <sup>3</sup> .....			2	6	177	1, 9, 17			
Grease brushes.....			1	3	173	1, 9, 17			
Grease pots.....			1	3	179	1, 9, 17			
Gunner's pouches, with small-parts cases.....				6		1, 5, 9, 13, 17, 21			
Hammer, copper.....			1	3	159	1, 9, 17			
Hand extractor.....	1			6	157	1, 5, 9, 13, 17, 21			
Latigo straps, 0.375 inch by 8 feet.....				6		1, 5, 9, 13, 17, 21			
Loading tools <sup>4</sup> .....		1		3		5, 13, 21			
Loading tools' case.....		1		3		5, 13, 21			
Mittens, pair <sup>5</sup> .....				6		1, 5, 9, 13, 17, 21			
Oil cans.....	1			6	176	1, 5, 9, 13, 17, 21			
Pliers.....		1		3	172	5, 13, 21			
Pouches for telescopic musket sights.....				6		1, 5, 9, 13, 17, 21			
Rammers.....	1			6	155	1, 5, 9, 13, 17, 21			
Resizing tools <sup>6</sup> .....		1		3	150	5, 13, 21			
Screw drivers.....		1	1	6	158	1, 5, 9, 13, 17, 21			
Spare-barrel cases.....				6		1, 5, 9, 13, 17, 21			
Spare-parts cases.....			1	3		1, 9, 17			
<i>Spare parts for rifles.</i>									
Actuator springs.....			2	6	10	1, 9, 17			
Barrels.....				6	14	1, 5, 9, 13, 17, 21			
Breechblocks with extractors and springs.....			1	3	63, 64	1, 9, 17			
Cartridge stops.....	1			6	119	1, 5, 9, 13, 17, 21			
Cartridge-stop holders.....	1			6	120	1, 5, 9, 13, 17, 21			
Cartridge-stop springs.....	1			6	114	1, 5, 9, 13, 17, 21			
Ejectors.....	1			6	118	1, 5, 9, 13, 17, 21			
Ejector caps.....	1			6	146	1, 5, 9, 13, 17, 21			
Ejector springs.....	1			6	116	1, 5, 9, 13, 17, 21			
Extractor with springs.....	1		4	18	63	1, 5, 9, 13, 17, 21			
Feed pieces.....			2	6	71	1, 9, 17			
Feed-piece springs (complete).....			2	6	55, 58-62	1, 9, 17			
Fermature nuts.....			2	6	72	1, 9, 17			
Firing pins.....	1		1	9	52	1, 5, 9, 13, 17, 21			
Front sights, including covers and screws.....			1	3	109, 111, 112, 113	1, 9, 17			
Locking nuts.....			2	6	78	1, 9, 17			
Locking screws.....	1			6	70	1, 5, 9, 13, 17, 21			
Rear sights (complete) <sup>7</sup> .....			1	3		1, 9, 17			
Sear springs.....	1			6	67	1, 5, 9, 13, 17, 21			
Stocks.....			2	6	46	1, 9, 17			
Spare rifle (complete).....				1					

<sup>1</sup> Carried tied to mule in duck cover.

<sup>2</sup> In ammunition boxes.

<sup>3</sup> One gas-cylinder cleaner, complete, consists of—  
1 gas-cylinder cleaner.  
1 cleaner holder.  
1 cleaner sleeve.  
1 cleaner sleeve pin.

<sup>4</sup> One loading tool, complete, consists of—  
16 guide screws (186).  
Loading-tool feet (164) and (168).  
2 loading-tool handles (161).  
2 loading-tool levers (162).  
2 loading-tool lever axes (163).  
2 pushing-bar axes (170).  
2 loading-tool lever washers.  
1 pushing bar (169).

<sup>5</sup> One loading tool, complete, consists of—Continued.

2 pushing-bar guides (171)

4 pushing-bar slides (185).

1 strip guide (167).

<sup>6</sup> Carried in rifle case, loose.

<sup>6</sup> One resizing tool, complete, consists of—

2 adjusting screws (148).

1 axis of roller.

4 blocking screws.

1 resizing-tool roller (151).

1 resizing-tool roller support (149).

1 resizing-tool roller frame (147).

<sup>7</sup> A rear sight complete does not include the rear-sight fixed base and screw. The windage screw is part of rear sight, complete, but is carried in a separate compartment.

**Statement of total equipment of 1 machine-gun company or troop, armed with the Benet-Mercié machine rifle, model of 1909—Continued.**

Article.	Com- pany.	Troop.	Where carried.	Property classification.	
				Class.	Section.
<i>Tools and accessories for packs.</i>					
Broad hatchets.....	3	3	On mules Nos. 3, 13, 20.....	IV	9
Cooling-sponge covers.....	6	6	On mules Nos. 1, 5, 9, 13, 17, 21.....	IV	1
Pick mattocks.....	3	3	On mules Nos. 2, 14, 19.....	IV	9
Picket pins and picket-pin eyes....	6	6	On mules Nos. 3, 6, 11, 14, 19, 22.....	IX	5
Picket-rope sections.....	4	4	On mules Nos. 2, 10, 14, 18.....	IV	9
Rigging covers.....	3	3	On mules Nos. 7, 14.....	IV	1
Rule, boxwood.....	1	1	On person.....	IV	9
Shovels, short-handled.....	6	6	On mules Nos. 2, 10.....	IV	9
Supply bags.....	8	8	In chests for supplies.....	IV	1
Other equipment shown else- where.					

Article.	No.	Where carried.	Property classification.	
			Class.	Section.
<i>Spare parts for harness.</i>				
Aparejo-top stick, right.....	1	In supply sack for leather and spare parts.		
Aparejo-stick, left.....	1			
Aparejo-boot stick, right.....	1			
Aparejo-boot stick, left.....	1			
Aparejo ribs (set of 10).....	2			
<i>Spare parts for special pack equipment.</i>				
(For pack frame.)				
Side braces.....	4	In chest for supplies.....		
Pack-frame pins.....	2			
Strap-loop clevises.....	2			
Superframes.....	2			
Hook hinge.....	1			
Arch.....	1			
Side bar.....	1			
Brace bar.....	1			
Side-bar board.....	1			
Brace-bar board.....	1			
Split pins 0.156 ( $\frac{1}{8}$ ) inch by 0.625 inch.....	10			
(For ammunition hanger.)				
Rear top braces.....	2	do.....	IV	1
Side braces, 1 right, 1 left.....	2			
Quick-release device.....	1			
5-sided strap loop, with 2-strap fastener.....	1			
Holding-down clips.....	4			
1.5 by 1.5 inch strap loop.....	1			
2 by 1.25 inch strap loop, with roller and fastener....	1			
1 by 0.5 inch strap loops.....	4			
(For rifle hanger.)				
Upper frame brace.....	1	do.....		
Hanger bar.....	1			
Diagonal brace.....	1			
Frame limb, front (drilled for front and rear), with 1 inch tongueless bar buckle, assembled.	1			
Rifle-hanger hasp.....	1			
Rifle-hanger hasp lock.....	1			
Rifle-hanger link, clasp, and clasp plate, assembled..	1			
Rifle-hanger clevises, with pin, assembled.....	2			
Ammunition box rest.....	1			
(For rivets.)				
0.187 ( $\frac{3}{16}$ ) by 0.5 round-head rivets.....	30	do.....		
0.187 ( $\frac{3}{16}$ ) by 0.875 round-head rivets.....	40			
0.187 ( $\frac{3}{16}$ ) by 1.25 round-head rivets.....	10			
0.25 by 0.75 round-head rivets.....	25			
0.25 by 1.75 round-head rivets.....	6			

*Statement of total equipment of 1 machine-gun company or troop, armed with the Benet-Mercié machine rifle, model of 1909—Continued.*

Article.	No.	Where carried.	Property classification.		
			Class.	Section.	
<i>Instruments.</i>					
Range finder, 80 cm. base, with carrying case and tripod.....	1	{Where most convenient unless otherwise specified in War Department orders.}	V	1	
Glasses, field, type EE (furnished by Signal Corps).	2				
Glasses, field, type EE (or types A or B) (furnished by Signal Corps).	2				
Glasses, field, type C (furnished by Signal Corps)...	2				
Article.	Com- pany.	Troop.	Where carried.	Property classification.	
				Class.	Section.
<b>MISCELLANEOUS.</b>					
Ammunition, rounds.....	39,600	39,600	In ammunition boxes.....	VIII	1
Chest for supplies <sup>1</sup> .....	1	1	In kit wagon.....	IV	1
Field picket line with 6 pins <sup>2</sup> .....		1	On troop pack.....	IX	5
Flag kits, combination standard (furnished by Signal Corps).	3	4	Where most convenient unless otherwise specified by War Department orders.		
Manila rope, 0.5-inch, feet <sup>1</sup> .....	200	200	In kit wagon.....	X	10
Marking outfit, for leather.....	1	1	do.....	X	
Marking outfit, for metal.....	1	1	do.....		
Pin and hammer chest <sup>2</sup> .....		1	On troop pack.....	X	1
Pistol-cleaning kit.....	1	1	In kit wagon.....	X	9
Polo equipment, sets (see Pamphlet No. 1879).		2	Not carried.....	IX	5
Seal stamp.....	1	1	In kit wagon.....	X	5
Stencil outfit.....	1	1	do.....		
Stencils:					
Canteen <sup>2</sup> .....	1	1	do.....	X	5
Haversack <sup>2</sup> .....	1	1	do.....		
Personal equipment <sup>2</sup> .....	1	1	do.....		
Supply sack for leather and spare parts. <sup>1</sup>	1	1	do.....	IV	1
Supply sack for leather <sup>1</sup> .....		1	do.....		
Target equipment (see Pamphlet No. 1902).			Not carried.....	X	7
Troop pack <sup>2</sup> .....		1	On pack mule.....	IX	5
Troop pannier <sup>2</sup> .....		1	On troop pack.....	X	9
Water buckets, canvas, large <sup>2</sup> .....		8	do.....	IX	5
Water tank <sup>2</sup> .....		1	In kit wagon on or troop pack.....		
<i>Furnished by Quartermaster Corps.</i>					
Kit wagon.....	1	1			
Harness for kit wagon.....	1	1			
Cooking utensils.....					
Company equipage.....					
<b>PERSONAL EQUIPMENT.</b>					
(See U. E. M.)					

*Statement of total equipment of 1 machine-gun company or troop, armed with the Benet-Mercié machine rifle, model of 1909—Continued.*

Article.	Com- pany.	Troop.	Where carried.	Property classification.	
				Class.	Section.
SADDLER'S TOOLS. <sup>1 2</sup>					
Awl blades, harness, assorted, Nos. 43 to 48, inclusive.		12	In tool bags, saddler's.		
Awl, pegging.		1	do.		
Awl, seat, handled.		1	do.		
Carriage, pricking, 3 wheels, Nos. 7, 8, and 10.		1	do.		
Compass, 6-inch.		1	do.		
Creaser, double, lignumvite.		1	do.		
Edge tool No. 1.		1	do.		
Edge tool No. 2.		1	do.		
Extra blades with followers for draw gage.		2	do.		
Gage, draw, brass.		1	do.		
Hammer No. 3, riveting.		1	do.		
Hafts, patent, awl, rosewood, with wrench.		2	do.		
Knife, round.		1	do.		
Knife, splitting.		1	do.		
Needle case, leather.		1	do.		
Needles, Glovers, No. 3, papers.		1	do.		
Needles, harness, No. 4, papers.		2	do.		
Needles, harness, No. 5, papers.		2	do.		
Needles, harness, No. 6, papers.		2	do.		
Nippers, cutting, 10-inch.		1	do.		
Oilstone, 1.25 by 2 by 8, Washita, unmounted.		1	In chest for supplies.		
Peg awl, handled, with wrench.		1	In tool bag, saddler's.		
Pliers, 6-inch.		1	do.		
Punch, revolving, 4 tubes, Nos. 4, 5, 6, and 7.		1	do.		
Rivet set.		1	do.		
Round hand punches, Nos. 5, 7, 8, and 10.		4	do.		
Rule, boxwood, 2 foot, 4 fold.		1	do.		
Screwdriver, 3-inch blade.		1	do.		
Sewing palm leather.		1	do.		
Shears, 10-inch, bent trimmers.		1	do.		
Shoe knife, broad point.		1	do.		
Shoe knife, square point.		1	do.		
Slicker, steel.		1	do.		
Stitching clamp.		1	In chest for supplies.		
Stitching horse.		1	In garrison.		
Thimble, best aluminum lined, steel.		2	In tool bag, saddler's.		
Tool bag, saddler's.		1	In kit wagon.		
Tool, claw.		1	In tool bag, saddler's.		
Awl blades, harness, assorted, Nos. 43, 45, and 48.	3		In chest for supplies.		
Awl, seat, handled.	1		do.		
Compass, 6-inch.	1		do.		
Edge tool No. 2.	1		do.		
Extra blades with followers for draw gage.	2		do.		
Gage, draw, brass.	1		do.		
Hammer, No. 3, riveting.	1		do.		
Hafts, patent, awl, rosewood, with wrench.	1		do.		
Knife, round.	1		do.		
Needle case, leather.	1		do.		
Needles, harness, No. 4, papers.	1		do.		
Needles, harness, No. 5, papers.	1		do.		
Needles, harness, No. 6, papers.	1		do.		
Nippers, cutting, 10-inch.	1		do.		
Oilstone, 1.25 by 2 by 8, Washita, unmounted.	1		do.		
Punch, revolving, 4 tubes, Nos. 4, 5, 6, and 7.	1		do.		
Punches, hand, Nos. 5 and 7.	2		do.		
Rivet set.	1		do.		
Rule, boxwood, 2-foot, 4-fold.	1		do.		
Shoe knife, square point.	1		do.		
Stitching clamp.	1		do.		
Thimble, best aluminum lined, steel.	1		do.		
Tool, claw.	1		do.		
Tool kit, cotton duck.	1		do.		

X

9

<sup>1</sup> All saddler's tools for companies to be carried in chest for supplies.

<sup>2</sup> Pertains to tools and accessories for pack outfits.

*Statement of total equipment of 1 machine-gun company or troop, armed with the Benet-Mercié machine rifle, model of 1909—Continued.*

Article.	Com- pany.	Troop.	Where carried.	Property classification.			
				Class.	Section.		
BLACKSMITH'S TOOLS. <sup>1</sup>							
Anvil, 34 pounds.....		1	In Schaller forge tool chest.....	X	9		
Apron, blacksmith's.....		1	do.....				
Box, shoeing, leather.....		1	do.....				
Chisel, handled, for cold iron, 1 pound 6 ounces.....		1	do.....				
Clinch cutter.....		1	do.....				
Clinching iron.....		1	do.....				
Creaser, steel handled.....		1	do.....				
Cutting nipper, 14-inch.....		1	do.....				
File, 12-inch, second cut.....		1	do.....				
File, 8-inch, 3-square, taper.....		1	do.....				
Fire rake.....		1	do.....				
Fire shovel.....		1	do.....				
Hammer, rounding, 2-pound, 14- inch handle.....		1	do.....				
Hammer, shoeing, 10-ounce.....		1	do.....				
Handles, cold chisel, spare.....		2	do.....				
Hardie, $\frac{1}{4}$ -inch shank, 1-inch bit.....		1	do.....				
Pritchel, $\frac{1}{4}$ -inch flats, 9-inch.....		1	do.....				
Schaller forge.....		1	In kit wagon.....				
Schaller forge tool chest.....		1	do.....				
Shoeing knife.....		1	In Schaller forge tool chest.....				
Shoeing pincers, 14-inch.....		1	do.....				
Shoeing rasp, 16-inch.....		1	do.....				
Tongs, horseshoer's, 18.5 ounces.....		1	do.....				
Tool kit for Schaller forge.....		1	do.....				
Vise, 2.5-inch jaws.....		1	In Schaller forge.....				
Wrench, screw, 8-inch.....		1	In Schaller forge tool chest.....				
Whetstone, 10-inch.....		1	do.....				
BLACKSMITH'S TOOLS. <sup>2</sup>							
Anvil, 17.5 pounds.....		1	In chest for anvil and block.....	X	9		
Apron, leather.....		1	In Cavalry forge chest.....				
Block, anvil.....		1	In chest for anvil and block.....				
Box, shoeing, leather.....		1	In kit wagon.....				
Bucket, iron.....		1	do.....				
Chest, anvil and block.....		1	do.....				
Chest, forge, Cavalry.....		1	do.....				
Chisel, handled, for cold iron, 2 pound.....		1	In Cavalry forge chest.....				
File, flat, 12-inch, bastard.....		1	do.....				
Fore punch and creaser, handled.....		1	do.....				
Forge, Empire, portable, modified for Army use.....		1	do.....				
Hammer, hand, handled, 2 pounds.....		1	do.....				
Hammer, shoeing, 10-ounce.....		1	do.....				
Hardie, $\frac{1}{4}$ -inch-square shank, 1 $\frac{1}{2}$ - inch bit.....		1	do.....				
Iron, clinching.....		1	do.....				
Knives, shoeing, bone handle.....		2	do.....				
Knife, toe.....		1	do.....				
Pincers, shoeing, 12-inch.....		1	do.....				
Pritchel, 0.75-inch flats, 9-inch.....		1	do.....				
Punch, nail.....		1	do.....				
Rake, fire.....		1	do.....				
Rasp, shoeing, 16-inch.....		1	do.....				
Shovel, fire.....		1	do.....				
Vise, 2 $\frac{1}{2}$ -inch jaws, 1 $\frac{1}{2}$ -inch opening.....		1	do.....				
Wrench, forge.....		1	do.....				
Wrench, screw, 12-inch, solid bar.....		1	do.....				
Tongs, horseshoer's, 12-inch.....		1	do.....				
MATERIALS FOR CLEANING AND PRESERVATION.							
(6 months' supply, all expendable.)							
Borax, pounds, lump.....	3	3	In chest for supplies.....			X	10
Brush, sash, No. 3.....	1	1	do.....				
Brush, varnish, No. 5-0.....	1	1	do.....				
Cloth, emery, No. $\frac{1}{2}$ , quire.....	1	1	do.....				

<sup>1</sup> Pertains to tools and accessories for pack outfits.

<sup>2</sup> The blacksmith's tools given in the following table are issued to Cavalry troops when equipped with the Empire forge.

*Statement of total equipment of 1 machine-gun company or troop, armed with the Benet-Mercié machine rifle, model of 1909—Continued.*

Article.	Com- pany.	Troop.	Where carried.	Property classification.			
				Class.	Section.		
MATERIALS FOR CLEANING AND PRESERVATION—continued.							
Cloth, emery, No. 0, quire.....	$\frac{1}{2}$	1	In chest for supplies.....	X	10		
Cloth, emery, No. 00, quire.....	$\frac{1}{2}$	1	.....do.....				
Cosmic, No. 80, soft, 1-quart cans.....	1	1	.....do.....				
Chamois skins not smaller than 13 by 17.....	1	1	.....do.....				
Dressing, russet leather, boxes.....	1	2	.....do.....				
Lye, powdered, cans, 1-pound, ap- proximate.....	2	2	.....do.....				
Naphthalene, pounds.....	5	10	.....do.....				
Oil, linseed, boiled, gallons.....	$\frac{1}{2}$	$\frac{1}{2}$	.....do.....				
Oil, linseed, raw, pints.....	1	1	.....do.....				
Oil, neat's-foot, gallons.....	5	10	8 for troop in store.....				
Oil, sperm, gallons.....	1	1	In chest for supplies.....				
Paint, olive-drab, 3d coat, pounds.....	15	15	.....do.....				
Primer, brown enamel, quarts.....	1	1	.....do.....				
Sal soda, pounds.....	3	3	.....do.....				
Soap, castile, pounds.....	10	20	.....do.....				
Soap, H and H cakes, or Paco.....	4	3	.....do.....				
Soap, saddle, Frank Miller's, pounds.....	10	40	20 for troop in store.....				
Sponges, 5-inch.....	30	70	.....do.....				
Waste, cotton, pounds.....	6	6	In canvas sack in kit wagon.....				
SADDLER'S MATERIAL.							
(6 months' supply, all expendable.)							
Awl blades, harness, assorted.....	3	6	In chest for tools.....	X	9		
Awl haft, patent, with wrench.....	1	1	In chest for supplies.....				
Buckles:							
Bar—							
$\frac{1}{2}$ -inch, center.....	1	30	.....do.....	X	10		
$\frac{1}{2}$ -inch, tongueless.....	1		.....do.....				
$\frac{1}{2}$ -inch, center.....	1	12	.....do.....				
$\frac{1}{2}$ -inch, center.....		6	.....do.....				
$\frac{1}{2}$ -inch, center.....		3	.....do.....				
$\frac{1}{2}$ -inch, Saalbach.....		3	.....do.....				
$\frac{1}{2}$ -inch, center.....	1	6	.....do.....				
$\frac{1}{2}$ -inch, center.....		6	.....do.....				
$\frac{1}{2}$ -inch, tongueless.....		3	.....do.....				
Roller—							
$\frac{1}{2}$ -inch.....		3	.....do.....				
$\frac{1}{2}$ -inch.....		6	.....do.....				
$\frac{1}{2}$ -inch.....	1	1	.....do.....				
$\frac{1}{2}$ -inch.....	3	6	.....do.....				
$\frac{1}{2}$ -inch.....	1		.....do.....				
Wire—							
$\frac{1}{2}$ -inch.....		6	.....do.....				
$\frac{1}{2}$ -inch.....		3	.....do.....				
$\frac{1}{2}$ -inch.....	1	24	.....do.....				
$\frac{1}{2}$ -inch, tongueless, roller.....	1	1	.....do.....				
Cineba straps, aparejo.....	2	2	.....do.....				
Cheek "D".....		6	.....do.....				
Chock plates, upper and lower.....	2	2	.....do.....				
Chock staple.....	1	1	.....do.....				
Duck, cotton, olive-drab:							
No. 8, yards.....	4	4	Supply sack for leather and spare parts.....				
No. 2, yards.....	4	4	.....do.....				
No. 1, yards.....	3	10	For company, in chest for supplies; for troop, in supply sack for leather.....				
End buckle, 1-inch, with clip.....	1	9	In chest for supplies.....				
End clips, $\frac{1}{2}$ -inch.....		12	.....do.....				
Foot staple:							
High.....	1	6	.....do.....				
Low.....	1	12	.....do.....				
Semicircular.....	1	6	.....do.....				
Hooks:							
Double, brass wire.....	4		.....do.....				
End, brass wire.....	4	4	.....do.....				
Gun sling.....		3	.....do.....				
Wire, for link.....		3	.....do.....				

*Statement of total equipment of 1 machine-gun company or troop, armed with the Benet-Mercié machine rifle, model of 1909—Continued.*

Article.	Com- pany.	Troop.	Where carried.	Property classification.	
				Class.	Section.
SADDLER'S MATERIAL—continued.					
Leather:					
Bridle, backs.....	1	4	In supply sack in kit wagon.....	X	10
Collar, backs.....	1	4	do.....		
Harness, pounds.....	30	120	do.....		
Latigo, side.....		1	do.....		
Loop, gun sling.....		6	do.....	IX	5
Nails, saddle.....		5	In chest for supplies.....		
Needles, harness:				X	9
No. 4, paper.....		1	do.....		
No. 5, paper.....		1	do.....		
No. 6, paper.....		1	do.....		
Glover's No. 3, paper.....		1	do.....	IX	5
Ornaments, brow band.....		4	do.....		
Ovals:				X	10
Saddle.....		5	do.....		
Saddlebag.....		3	do.....	IV	1
Pins, screw, brass, 1-inch, gross.....		1	do.....		
Rendering rings, 1½-inch.....	2	2	do.....		
Rings:				X	10
1 inch diameter.....		6	do.....		
1 inch diameter, rifle scabbard.....		3	do.....		
1½ inches diameter, saddle.....	1	12	do.....		
1½ inches diameter, throat strap.....		3	do.....		
2 inches diameter, halter.....	2	6	do.....		
4 inches diameter—					
Cincha strap.....	1	6	do.....		
Quarter strap.....		6	do.....		
D, 1 inch diameter, feed bag.....		6	do.....		
Rivets and burs, brass:					
¾-inch, No. 12, pounds.....		1	do.....	X	10
¾-inch, No. 12, pounds.....		1	do.....		
¾-inch, No. 10, oval head, pounds.....	1	1	do.....		
1-inch, No. 8, oval head, pound.....		1	do.....		
Rope:					
¾-inch, halter bridle, feet.....	50	50	do.....	X	10
¾-inch, halter, feet.....	50	1,000	For company, in chest for supplies; for troop, in supply sack for leather.....		
			3 in chest for supplies, rest in stores.....		
Screws, brass, 1-inch, No. 6, gross.....		1	In chest for supplies.....	IX	5
Sheepskin, with wool on.....		8	do.....		
Shields, saddle:					
11-inch.....		1	In chest for supplies.....	IX	5
11½-inch.....		2	do.....		
12-inch.....		1	do.....		
Snap hooks:				X	10
Canteen, cavalry.....		3	do.....		
Haversack.....	2		do.....	IX	5
Snaps, German:					
1-inch.....		8	do.....	IX	5
1-inch.....		6	do.....		
Snaps, swivel:				X	10
Oval loop, 1½-inch.....	1	1	do.....		
1-inch, No. 16.....		3	do.....	IX	5
Squares, halter.....	1	18	do.....		
Strap loops, feed-bag.....		6	do.....	IX	5
Studs, saddle-bag.....		3	do.....		
Tacks, copper, No. 12, paper.....		1	do.....	X	10
Tacks, copper, No. 20, paper.....		1	do.....		
Thimble, aluminum-lined, steel.....		1	do.....		
Thread, shoe:					
No. 3, brown, pound.....	1	1	do.....	X	10
No. 10, brown, pound.....	1	1	do.....		
Wax, stitching, brown, pound.....	1	2	do.....		
Webbing, olive-drab:					
Cotton, heavy, 1-inch, yards.....	1	11	do.....	X	10
Halter, 1½-inch, yards.....	1	7	do.....		
Jute, ¾-inch, yards.....	2	9	do.....		



*Statement of total equipment of 1 machine-gun company or troop, armed with the Benet-Mercié machine rifle, model of 1909—Continued.*

Article.	Com- pany.	Troop.	Where carried.	Property classification.	
				Class.	Section.
SADDLE'S MATERIAL—continued.					
<i>For polo equipment.</i>					
Buckles:					
Wire—					
1-inch.....		2	Not carried.....	X	10
1-inch.....		2	do.....		
1-inch.....		12	do.....		
1-inch.....		4	do.....		
Stirrup strap, 1½-inch.....		2	do.....		
Girth, 1-inch.....		6	do.....		
Rings, ½ inch diameter.....		4	do.....		
Web, linen, straining:					
3½-inch, yards.....		5	do.....		
5-inch, yards.....		7	do.....		

WAR DEPARTMENT,

OFFICE OF THE CHIEF OF ORDNANCE,

*Washington, September 6, 1917.*

September 6, 1917.

Form No. 1926.

Ed. Sept. 6-17—5,000.

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# INDEX.

## A.

	Page.
Accessories.....	70
Actuator, description.....	17
Actuator spring, function.....	18
Actuator-spring seat, description.....	18
Alphabetical list of component parts of rifle.....	11
Ammunition.....	52
Ammunition box, description.....	52
Ammunition feed strip, description.....	52
Ammunition hanger, description.....	62
Aparejo:	
Model of 1911, description.....	57
Instructions for setting up.....	58
Cincha, model of 1910, description.....	58

## B.

Ballistics.....	8
Barrel, description.....	13
Barrel case, description.....	53
Barrel group, parts in.....	13
Barrel-rest connection piece:	
Male, description.....	27
Female, description.....	27
Barrel-rest front leg, description.....	28
Barrel-rest front-leg foot, function.....	28
Barrel-rest front-leg separator, description.....	28
Barrel-rest group, parts in.....	27
Barrel-rest head, description.....	27
Barrel-rest plunger, location.....	27
Blinder, model of 1916, description.....	56
Bottom plate, description.....	16
Breakages.....	45
Breechblock, description.....	18
Broad hatchet-head case, description.....	63
Butt plate, description.....	25

## C.

Care of russet leather.....	61
Cartridge base stop, function.....	20
Cartridge extractor, description.....	19
Cartridge stop, description.....	20
Cartridge-stop holder, function.....	20
Cartridge-stop spring, function.....	20
Cocking handle, description.....	23

	Page.
Cooling-sponge cover, description.....	63
Corona, model of 1910, description.....	56
Cover plate, location.....	16
Crupper, model of 1912, description.....	58

## E.

Ejector, location.....	21
Ejector bushing, description.....	21
Ejector cap, description.....	21
Ejector spring, function.....	21
Elevating-screw binder, description.....	26
Elevating-screw binder lever, description.....	26
Elevating screw binder lever pivot, description.....	26
Elevating-screw slide, description.....	26
Elevating-screw tube, location.....	24
Elevating-mechanism end plugs, function.....	25
Elevating-mechanism feet, description.....	25
Elevating-mechanism group, parts in.....	25
Elevating-mechanism guide rod, location.....	25
Equipment:	
Horse.....	75
Instruments.....	72
Miscellaneous.....	72
Total.....	66
Extractor, description.....	19
Extractor (defective cartridge), description.....	44
Extractor spring.....	19

## F.

Feed-mechanism group, parts in.....	20
Feed piece, description.....	20
Feed-piece housing cover, description.....	17
Feed-piece spring, description.....	20
Feed strip.....	52
Fermeture nut, description.....	21
Firing mechanism group, parts in.....	17
Firing pin, description.....	19
Front feed guide, description.....	16
Front sight, description.....	15
Front sight carrier, description.....	14

## G.

Gas adjustment.....	15
Gas cylinder support, description.....	14
Gas-nozzle ring, description.....	14
Gas regulator adjustment.....	14
General information.....	37
Guard, description.....	22
Guard group, parts in.....	22
Gunner's pouch, description.....	55

## H.

Halter bridle, model of 1910, description.....	56
Hand-guard assembling plates, location.....	27

	Page.
Hand-guard body, description.....	27
Hand-guard body stiffening piece, location.....	27
Hand-guard front stiffening piece, location.....	27
Hand-guard group, parts in.....	27
Hand-guard leg catches, function.....	27
I.	
Improper manipulation of rifle.....	42
Inability to keep rifle on target.....	37
Inner elevating screw, description.....	25
Instructions for assembling and disassembling.....	29
Instructions for cleaning.....	47
Instructions for firing.....	36
J.	
Jams.....	41
L.	
Latch plate, location.....	24
Latch spring, location.....	23
List of plates.....	5
Loading tool, description.....	54
Loading-tool case, description.....	55
Locking mechanism group, parts in.....	21
Locking nut, description.....	21
Locking screws, function.....	21
M.	
Malfunctioning of parts.....	41
Material, cleaning and preserving.....	74
Material, saddler's.....	75
O.	
Organization.....	7
Outer elevating screw, description.....	25
Operation of rifle.....	35
P.	
Pack frames, description.....	62
Pack harness.....	56
Picket pin and eye, description.....	64
Picket-rope section, description.....	64
Pioneer's tools.....	65
Pouch, model of 1911, for telescopic sight, model of 1908.....	52
R.	
Radiator, description.....	14
Rear-feed guide, description.....	16
Rear-sight aperture disk, description.....	29
Rear-sight drift slide, description.....	29
Rear-sight elevating screw, function.....	28
Rear-sight fixed base, description.....	28
Rear-sight group, parts in.....	28
Rear-sight leaf, description.....	28
Rear-sight movable base, description.....	28

	Page.
Rear-sight slide, description .....	29
Rear-sight slide cap, description .....	29
Rear-sight windage screw, location .....	29
Receiver group, parts in .....	15
Receiver, description .....	15
Regulator, description .....	14
Replacing of parts .....	34
Resizing tool, description .....	54
Resizing of feed strip .....	55
Rifle:	
Action in firing .....	8
Alphabetical list of component parts .....	11
Assembling .....	33
Case, description .....	63
Cleaning and care of .....	47
Dismounting .....	30
General description .....	11
General information .....	37
Hanger, description .....	63
Operation:	
Adjustment of gas regulator .....	37
Examination of gun before firing .....	38
Firing .....	36
General hints in shooting .....	40
Loading .....	36
Packing .....	36
Points observed before going on firing line .....	46
Points observed during firing .....	46
Points observed after firing .....	47
Preparing for firing .....	35
Possible troubles and remedies for .....	43
Serial list of component parts .....	9
With its ammunition (parts considered under) .....	52
Rigging cover, description .....	64
Russet leather (care of) .....	61
S.	
Saddle blanket, description .....	57
Sear, description .....	24
Sear spring, location .....	24
Serial list of component parts of rifle .....	9
Spare parts for rifle .....	71
Spare-parts case, description .....	53
Spare parts for pack harness and tools .....	71
Spare parts for special pack equipment .....	71
Sobrejalma, model of 1910, description .....	57
Special pack equipment .....	62
Stock group, parts in .....	24
Stock, description .....	24
T.	
Targets .....	36
Telescope, description (telescopic sight) .....	50

	Page.
Telescope lever, description (telescopic sight).....	50
Telescope slide, description.....	50
Telescopic bracket, function.....	50
Telescopic sight:	
Model of 1908, nomenclature.....	49
Model of 1908, description.....	49
Adjustment and care of, for drift.....	51
Adjustment and care of, for elevation.....	51
Adjustment and care of, for focus.....	50
Adjustment and care of, general.....	50
Telescopic sight bracket, location.....	50
Tools:	
Blacksmith's.....	74
Rifle.....	70
Saddler's.....	73
Trigger, description.....	24

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